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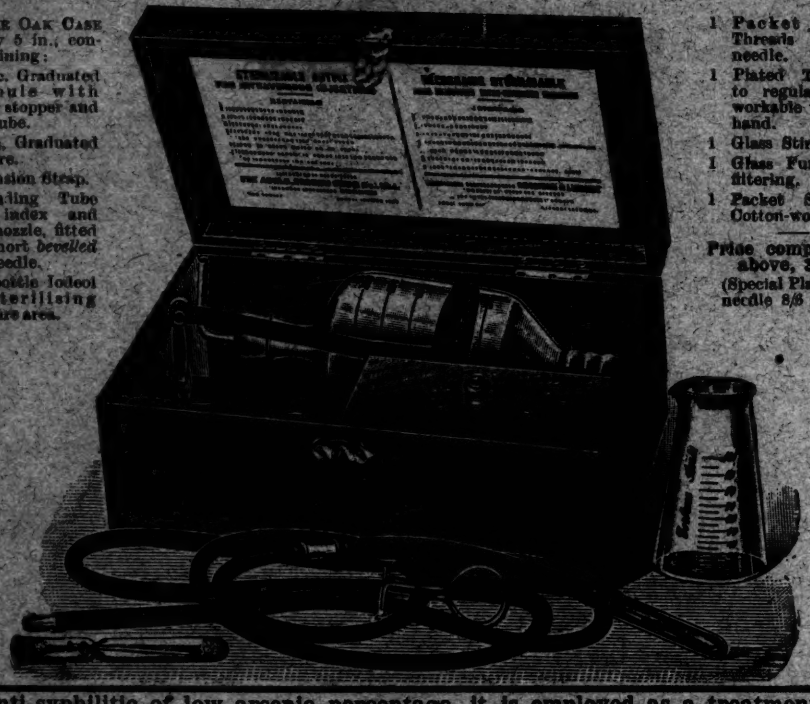

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INFECTION OF HAEMOTHORAX BY ANAËROBIC GAS-PRODUCING BACILLI.

BY

LIEUT.-COLONEL T. R. ELLIOTT, F.R.S., R.A.M.C.,

AND

CAPTAIN HERBERT HENRY, M.D., R.A.M.C.

(A Report to the Medical Research Committee.)

WHEN a man has been wounded in the chest, the two chief questions which arise in the minds of those who have the care of his case are whether his life will be endangered by further leakage of blood and air into the pleural cavity, or by the development of an infection.

Such figures as have been collected up to the present show that about one-fourth of all cases of haemothorax from gunshot wounds of the chest in this Flanders campaign are infected. In consequence of this frequency of sepsis, the principle of early exploration as a test for bacteriological infection of a haemothorax is adopted in all our military hospitals. But experience of the treatment of chest wounds in France is continually emphasizing the need for still greater vigilance in the early detection of sepsis, because there exists one particular group of infected cases which, though common, is liable to errors in diagnosis and treatment on account of its peculiar nature. A paper was written by us in description of this particular clinical group eighteen months ago, but owing to various circumstances it was not published at the time. A year's further observations, and in particular what was seen with the recent casualties from the fighting on the Somme, have convinced us that the need still exists for a more or less formal account of what may happen in the course of these chest wounds, for this particular infection seems to have been fully as common this autumn as ever it was before in France.

The group with which this paper deals is that due to the growth in a haemothorax of certain anaërobic bacilli, which may produce gas in the pleural cavity in so rapid an abundance that the physical signs of what is really a case of serious infection may be such as to lead the surgeon to the opinion that he is dealing only with a simple non-infected pneumo haemothorax that is being aggravated by a progressive leak of air from the lungs. To act on this opinion and leave the patient to rest and morphine, though the correct treatment for the early stages of a simple air pneumothorax, is merely to await the death of a man whose life might have been saved by timely recognition of the sepsis and immediate rib resection.

This form of infection with gas production is frequent. Out of the first 500 specimens of haemothorax fluid examined by one of us in the ordinary routine of laboratory work, 195 were found to be septic; and of these, 87, or 43.6 per cent. of the total of septic cases, were proved to be infected with such anaërobic bacilli.

After a latent period of varying duration, the gas and the poisons produced by the bacilli may develop in many instances with fulminating rapidity amid the haemothorax, so that a case which on the second or third day following the wound was regarded only with suspicion of sepsis has often been seen to pass in the next forty-eight hours into a state of the gravest danger. Even if the patient's life is not immediately imperilled by a developing toxaemia, there is still a disadvantage in every hour's delay in detecting the infection, because the increasing volume of gas compresses the lung and enlarges the empyema cavity, so that subsequent convalescence after rib resection is likely to endure for a longer time than would have been necessary had the pleural cavity been evacuated on an earlier date.

For both reasons, therefore, whether to save life or to lessen the period of invalidism, it is of the utmost importance that every endeavour be made by medical officers to recognize this type of infection at the earliest possible moment, and to deal with it without delay.

GENERAL STATISTICS.

During the year 1915–1916, in a consecutive series of 145 examples of septic haemothorax of which clinical notes were taken by us, the infection was bacteriologically identified in 101 cases. The details are as follows:

Organisms Found.	No. of Cases.	Total Deaths.	Total Deaths from Septic Haemothorax of Hopeless Gravity and without other Complications.
Pneumococcus, *B. influenzae*, and *M. tetragenus*—that is, from respiratory tract	17	4	2
Streptococcus and staphylococcus	38	11	4
Anaërobic gas bacilli (alone = 23, with other organisms = 19)	42	14	4
Diphtheroid bacillus, *B. coli*, etc.	4	0	0
	101	29	10

From these figures it appears that the haemothorax was infected from the lacerated lung in rather less than 20 per cent. of the total; and that when infection was introduced from without, from the soiled skin or by shreds of clothing, the anaërobic bacilli were present in about one half of such cases of external infection.

Some statistics given elsewhere by one of us (in a paper with Sir John Rose Bradford, *British Journal of Surgery*, iii, p. 249, 1915) showed that one-fourth of the cases of haemothorax seen at certain base hospitals during the first year of the war were infected. From this it follows that approximately *10 per cent. of all cases of haemothorax* seen at this level on the L. of C. contain anaërobic gas-producing bacilli. These are, or would become, for the most part, gravely ill cases; but with proper recognition of the sepsis and timely rib resection the mortality among instances of such infection is shown by the last column in the table printed above to be very similar to that for the other types of infected haemothorax, namely about 10 to 15 per cent. This reduced mortality is the total of deaths, four in number, which were due simply to the infection of the haemothorax, and which appeared to be hopeless according to the present methods of treatment. The other ten deaths, which were put aside for the purposes of attaining this figure, included three in which there was some error in the surgery employed, and six in which the empyema was drained for various reasons at too late a date to give much chance of recovery.

It must be admitted that the distinction which is made in the analysis of these numbers rests on a personal judgement gained by fuller experience of those which might have been saved by earlier operation, and of those which seemed hopeless, so that it is not one which yields an exact figure of mortality. But the results actually obtained in another series of these gas bacillus infections, which was collected subsequently to that quoted above, proved that their death-rate at base hospitals should not exceed 15 per cent. Most of the cases recover rapidly, even though they may have seemed to have been desperately ill before the empyema was drained.

It will be observed that the wound in every single one of the fourteen clinical examples of anaërobic infection, which are quoted later in this paper, was caused either by a fragment of high explosive shell or by shrapnel ball. Undoubtedly there is a greater liability for anaërobic bacilli to be carried in by shell fragments than by rifle bullets, but the preponderance is by no means so exclusive as these cases would suggest.

PATHOLOGICAL PROCESSES.

Certain details of the pathological changes which occur in the development of a septic haemothorax require description first in order that the clinical features may be better understood.

Jagged missiles which enter the chest often carry in shreds of dirty clothing around them. Most of these infected shreds are left close to the entrance wound; the remainder may adhere, especially to a shell fragment, and if such be the case infection must develop around the latter in its final resting place. This resting place is generally either in the structures of the thoracic wall or within the hollow of the pleural cavity. Pieces of shell, and more rarely bullets, may occasionally be embedded in the lung itself; but as a rule these missiles have enough

momentum to force their way through the non-resistant pulmonary tissue, after which they may fail to penetrate the bony framework of the chest, and so drop back into the pleural cavity.

The wound made through the lung is generally a lacerated track surrounded by a considerable amount of haemorrhagic extravasation. From these torn tissues and from the wound in the thoracic wall, where ribs are often splintered, fibrin ferment will be liberated in sufficient quantity to coagulate rapidly all the fibrinogen in the blood that is poured out from the wound track in the lung or chest wall. But the continued movements to which the effused blood is subjected within a breathing chest interfere with its coagulation and prevent its setting into a massive jelly. The fibrin is partly "whipped" out and deposited on the pleural surfaces; irregular lumps of more complete blood clot may form like mush ice in the haemothorax, especially in the recesses of the pleural sac and along the vertebral groove at the back when the patient is recumbent. The rest of the defibrinated blood remains as a fluid, a fluid which resembles blood in depth of colour more or less closely according to the number of red corpuscles that have escaped entanglement in the primary clot and are floating freely in it.

The pleural surfaces react to the irritation by the blood, and a serous effusion containing lymphocytes and endothelial cells, with a few polymorphonuclear leucocytes, is added to the haemothorax. Often the fibrinogen of this effusion also is clotted by the surplus of ferment from the haemothorax blood, and it reinforces the deposit of clot laid down on the pleura, so that adhesions of some tenacity are soon developed at the boundaries of the haemothorax, and thus separate the collection of fluid and clot from the rest of the pleural sac.

We are dealing in this paper exclusively with infections by anaërobic bacilli which are introduced chiefly from without, and therefore respiratory tract infections that may develop in the neighbourhood of the lacerated lung can be neglected. An infection from without may be introduced, broadly speaking, in two ways.

I. *Generalized Form.*

The infection may be disseminated throughout the fluid haemothorax from the very commencement, as occurs most conspicuously where the external wound track remains open and septic, so that organisms are sucked in with the to-and-fro currents produced by respiration.

II. *Localized Form.*

The septic focus may be one which is buried in a mass of blood clot—for example, a shell fragment with tattered clothing around it lying at the bottom of the pleural sac. Ultimately the organisms escape through the agglomerated clot, and are spread by respiratory movements through the pool of serum above.

The anaërobic organisms, presumably on account of their feeble powers of growth at first in freshly shed blood, often appear to grow slowly from an implantation which is enveloped by blood clot as described in (II). During this time they produce toxic substances which are absorbed into the circulation from the tissues around the septic blood clot, causing a general febrile reaction, while the same substances diffuse into the fluid haemothorax and excite from the pleural membranes an increase of serous exudate, to which polymorphonuclear cells are now added in greater numbers.

The growth of the bacilli within the septic clot is generally accompanied by the evolution of foul gas, which at first may remain imprisoned in the mass of clot as a small pneumothorax localized within the general haemothorax. Ultimately this gas bursts the clot asunder, and so scatters the infection through a wider field, or the bacilli make their own way directly through the obstructing clot into the fluid haemothorax.

Condition (II) is then thrown into the ordinary form of condition (I), with the free pullulation of bacilli throughout all the haemothorax fluid. An intense inflammatory pleurisy follows, and there is an abundant discharge of fluid effusion and of pus cells into the pool. Gas formation sometimes increases the volume of the empyema even more rapidly than does the fluid exudate, and this gas now lies free above the upper level of the fluid. Hour by hour the lung collapses more and more beneath the growing pressure; but the early adhesions at the boundary of the haemothorax usually hold fast and tether the upper part of the lung so that its collapse is not symmetrical and complete, and the gas may fail to reach a mobile position at the apex of the pleural sac. On account of this inability of the lung on the side of the haemothorax to collapse completely away from the side of the chest, the increasing volume of the pyo-pneumothorax causes an extra displacement of the mediastinum and the heart to the opposite side.

Apart from these local changes within the pleural sac on the side of the septic haemothorax, there are three directions in which the spreading results of the infection may appear.

1. In the opposite pleural sac, causing a pleurisy which is usually dry and rarely leads to the development of effusion and empyema. This contralateral pleurisy is a very frequent accompaniment of a septic haemothorax, especially when the latter has been neglected for some days.

2. In the pericardial sac, a path of spread which is much less common than that into the contralateral pleural sac, though when the infection takes this course, a purulent effusion usually develops and is quickly fatal. None the less, there is unequivocal evidence that a neighbouring infection may excite a dry pericarditis from which there is recovery as complete and as straightforward as in the case of a contralateral dry pleurisy.

3. In the blood stream, producing general toxaemia or even septicaemia. This may develop with rapid fatality when the focus of infection lies in vascular tissue, as when a shell fragment is embedded in the lung. In such a case there is haemolysis of the circulating blood, the serum acquires a deep yellow tint from the changes undergone by the freed blood pigment, and a jaundiced colour spreads over the face and body of the patient as a signal of the toxic state that is threatening his life.

The results of sepsis may appear along this third path when the infection is a pure one by anaërobic bacilli only. But our observations suggest that these bacilli do not easily spread from a haemothorax into the pericardial sac or the opposite pleura; and the infections described under headings 1 and 2 are probably in most of the cases due to an associated contamination with streptococci, which are the active invaders of the outlying regions beyond the haemothorax.

The Results Obtained by Exploratory Puncture.

Before narrating the clinical features which are associated with an infected haemothorax of this nature, it is best to describe the varieties of samples that may be met with on exploration of the chest, because it will be continually necessary to refer to these in the course of the clinical description. The exploring needle is the sole means for obtaining the final evidence for a strict diagnosis. Cases which clinically present the appearance of being septic may be found by repeated punctures to be completely sterile; and on the other hand, cases which seem almost innocent, and beyond suspicion so far as rise in temperature is concerned, may turn out then and there to be heavily and dangerously infected. Therefore the needle should be used whenever doubt arises.

The contents of the pleural cavity, when infection is present in a haemothorax, often are not homogeneous. The needle may chance to enter an area of reactive serous effusion, or of haemothorax fluid, or blood clot; and any one of the samples so drawn off may at first be free from organisms, though a couple of days later bacilli may be abundant everywhere and their presence be at once made evident by the malodorous smell attached to the fluid as the consequence of their growth.

The following are the varieties of samples that may be met with in exploration of a haemothorax infected with anaërobes:

(*a*) A "blood" with an offensive odour, and of an intense purple colour, which is darker and more transparent than that of venous blood. This fluid contains dissolved haemoglobin from haemolysis of the red corpuscles, and consequently it will throw up a crimson froth in the barrel of the syringe. The crimson-purple colour is in itself almost characteristic of an abundantly growing infection by anaërobic bacilli; but the foul smell is the chief criterion,

and it may be accepted as sufficient proof of infection. From such a sample, on standing, a large flocculent deposit of reddish-brown pus may fall down, but the eye cannot recognize the presence of this pus in the freshly drawn sample. In some of these cases the needle may at first find only offensive gas under pressure, and fail to withdraw any fluid.

(*b*) A fluid that is obviously loaded with pus, reddish-pink or deep buff in colour, and either slightly or not at all offensive.

(*c*) A red fluid like that of an ordinary sterile haemothorax and inoffensive. Microscopic examination finds in films from this fluid a moderate increase in the number of polymorphonuclear cells, and bacilli appear on culture.

(*d*) A yellow serous fluid with the usual fine gelatinous secondary clot on standing, and the same findings under the microscope as in (*c*).

The offensive odour is the only criterion of infection that can be accepted at once without further microscopic study.

A purulent appearance may in very rare cases be given by a traumatic leakage of chyle, so that this naked-eye appearance is not completely reliable.

Otherwise all specimens should be examined under the microscope, and cultures made if no bacilli can be seen in direct films. The most rapid incubation is that within the chest itself. If a case is clinically suspicious, but the first sample receives a negative report from the bacteriologist, a second and even a third exploration should be made on the following days and in different places.

The delay in bacteriological proof of infection in a case which on clinical grounds appears certainly to be septic is a striking feature of this particular group. Such delay is never met with in infection by streptococci and staphylococci. It occurs occasionally with infection by the influenza bacillus or pneumococci, when it may easily be ascribed to a slow passage of these organisms from injured areas within the lung out into the surrounding haemothorax. But it is quite frequent with the anaërobic bacilli, although there can be no doubt that the infection in such cases was introduced from without at the moment when the wound was received.

Thus out of one continuous series of septic cases:

Thirty were found to be due to streptococci and staphylococci, and the proof of the infection in every one of these cases was found at the first exploration.

Forty-five were infected by anaërobic bacilli, and nineteen of these were infected only by members of this group. Of the latter, six were reported on the first sample to be absolutely sterile, and four others yielded proof of infection only by culture. Hence 50 per cent. of these pure infections by anaërobic bacilli yielded on first exploration a fluid that showed no organisms in a direct and careful film examination. These first samples were taken on days varying from the fourth to the eighth after the wound had been received, and the real proof of bacteriological infection was obtained from one to five days after the first sample that was reported to be sterile.

Clinical examples of this delay will be quoted later. The essential fact is that infection by anaërobes often tends to remain localized for a relatively long time in some part of a haemothorax, probably within clot. Hence early exploration of the chest may in one place strike a bubble of gas and foul blood as in (*a*), while in other places it may discover only such fluids as (*c*) or (*d*), fluids which after the lapse of a few days would in the same places be developed respectively into (*a*) or (*b*).

Bacteriological Observations.

The method of examination in the laboratory of pleural fluids taken from cases of haemothorax has been uniform throughout and has resolved itself into two stages, namely:

A. The immediate microscope examination of the fluid or of its centrifuged deposit.

B. The preparation from it of both aërobic and anaërobic cultures.

A.—*The Direct Microscopic Examination.*

Air-dried and flame-fixed films made on microscope slides are rapidly stained with a drop of Loeffler's alkaline methylene blue, and examined in the wet stain through a superimposed cover-glass. This method affords immediate and valuable evidence of the nature both of the cellular exudate and of the infecting micro-organisms. A second film yielding supplementary information is stained by Gram's method, while the first is being examined.

In fluids which are frankly purulent or which throw down a purulent deposit on centrifuging, it is a rule to find organisms after a brief search through these two films. The only microbe that is likely to escape detection by this simple routine is the influenza bacillus, which can be demonstrated by staining in weak carbol-fuchsin for half an hour.

We have found that, with reasonable patience in searching, the wet methylene-blue film and the Gram film together are sufficient to show the presence of organisms in 90 per cent. of all fluids subsequently proved by cultures to be infected, and to give an approximate indication of their nature. The accompanying table gives briefly a list of the organisms likely to be met with in an infected haemothorax fluid:

Table of the More Common Organisms Found in Infected Haemothorax Fluids.

Cocci.
- Gram-negative:
  - *Micrococcus catarrhalis.*
- Gram-positive:
  1. Streptococci.
  2. Staphylococci.
  3. Pneumococcus.
  4. *Micrococcus tetragenus.*
  5. Sarcinae.

Bacilli.
- Gram-negative:
  1. *B. coli* and coliform organisms including *B. proteus* and *B. pneumoniae.*
  2. *B. pyocyaneus.*
  3. *B. influenzae.*
- Gram-positive:
  - (*a*) Aërobic—
    1. *Subtilis-mycoides* group.
    2. A diphtheroid bacillus.
  - (*b*) Anaërobic—
    1. *B. perfringens.*
    2. *B. sporogenes.*
    3. *B. von Hibler IX* and others.
    4. A small diphtheroid.

The cocci can be neglected in the present discussion, for no real anaërobes were found in this group, and none are capable of forming gas. Among the Gram-negative organisms in the bacillary group it is only the coli-like bacilli that are gas producers; but none of these were found by themselves—that is, in the absence of an anaërobe—to give rise to gas inside a haemothorax cavity.

There remain only the Gram-positive bacilli for consideration.

Diphtheroids.

The stout aërobic diphtheroid bacillus, which closely resembles the bacillus of Hoffman, is but rarely seen in films, and as a rule it becomes obvious only in cultures. It is always associated with large numbers of other microbes, and may be looked upon merely as evidence of gross contamination of the pleural contents. The anaërobic diphtheroid is a small short granular bacillus growing in dense clumps, and so far we have succeeded in growing it only in liquid media. Its exact nature is so far undetermined. It does not produce gas, and would appear to be relatively harmless.

Aërobes.

It is with organisms of the *subtilis-mycoides* group that confusion may arise in diagnosis of anaërobe infections by the film method, for there are no morphological features which distinguish organisms of this type from the real anaërobes. They are stout Gram-positive, anthrax-like bacilli, which may give streptobacillary and filamentous forms and may also form spores, all of which features are common to one or other of the anaërobes. Eleven out of 195 septic cases showed sporing anaërobes of this type; in four of these the infection, which might have been an accidental contamination, was pure with a relatively mild clinical course; in five the combination of aërobe and anaërobe existed, while in the remaining two a streptococcus was found in addition to the sporing aërobe. The chance of confusing aërobe with anaërobe is therefore small, and one may take it that the presence of stout anthrax-like Gram-positive bacilli in a film is very strong presumptive evidence of anaërobic infection.

Anaërobes.

A short thick bacillus occurring singly or in pairs with occasional short chains is likely to be *B. perfringens.*

Streptobacillary and filamentous forms are common to a number of anaërobes, so that these morphological features are as a rule of little value as a means of differentiation.

The presence of sporing forms in a direct film bespeaks *B. sporogenes* or aërobic sporers. Out of eighteen infected haemothorax fluids proved to contain *B. perfringens* on culture, only one answered the spore test by heating to 80° for twenty minutes. In the bulk of cases, then, *B. perfringens* is present only in the vegetative and not in the sporing form.

It will be evident from these facts that the examination of morphological features in a film is never sufficient for the identification of these stout Gram-positive bacilli, and that the method must be supplemented by cultural tests.

B.—*Cultural Examination.*

Cultures have been made from every specimen of haemothorax fluid sent to the laboratory. Implantations of varying amounts were made into plain broth, and on to agar either in tubes or in plates. These were found to be sufficient to grow any aërobic organisms met with, for the richness of the original sample in protein and in haemoglobin content make it unnecessary to use any special media containing these substances.

Anaërobic cultures were made by inoculating freshly sterilized milk under paraffin oil.

The investigation of the anaërobes found in haemothorax fluids was carried just sufficiently far enough to come to a determination of the main features of the organisms, for it was impossible in the routine of work to track each anaërobe down separately. The bulk of the infections were multiple—that is, there existed together several anaërobes, or aërobe and anaërobe, the combination of *B. perfringens* and a streptococcus being the most frequent.

The following simple scheme was found to give information which placed the organisms met with in certain more or less clearly defined groups.

I. *The B. perfringens Group.*

If one accepts the definition of *B. perfringens* as being a stout Gram-positive non-motile anaërobic bacillus, which gives stormy fermentation of milk, and which does not form spores in milk, then the definition groups together a number of organisms which have been described from time to time by different authors under different names. The question of the kinship and identity of these organisms cannot be here discussed. The group comprises:

1. *B. aërogenes capsulatus* of Welch and Nuttall; synonym, *B. welchi*.
2. *B. perfringens* of Veillon and Zuber.
3. *B. enteritidis sporogenes* of Klein. This was probably a mixed culture of a sugar-splitting non-motile bacillus of the *perfringens* type, together with a motile proteoclast akin to *B. sporogenes*.
4. Bacillus of articular rheumatism of Achalme.
5. *B. phlegmonis emphysematosae* of Fraenkel.
6. *B. saccharobutyricus immobilis* of Schattenfroh and Grassberger.

The primary milk culture inoculated with a pipetteful of haemothorax fluid is examined after twenty-four and forty-eight hours' incubation. The development after twenty-four hours of stormy fermentation, indicated by strong coagulation followed by explosive disruption of the casein clot, is taken as evidence of *B. perfringens*. There is no other anaërobe that produces this effect with such vigour under suitable conditions. In the case of an indefinite or delayed reaction in the primary culture, one or two subcultures into milk may serve to dispel any doubt. Out of 87 specimens of haemothorax fluid proved to be infected with anaërobes, 71 specimens, or *81.6 per cent.*, gave this typical milk reaction, and were thus shown to contain *B. perfringens*.

The organism produces no digestion of the casein clot formed from ordinary milk. If naked-eye signs of digestion are present, then some other organism, aërobe or anaërobe, is present in the cultures. It never spores in milk, and, indeed, most cultures in milk die in about a week or ten days. A subculture on alkaline minced meat gives spores after several days' incubation, and the medium becomes bright red in colour. There is never any blackening of the meat.

II. *The B. sporogenes Group.*

A pipetteful from one of the original milk cultures taken after three or four days' incubation is heated to 80° for twenty minutes. By this means all vegetative organisms are killed, including *B. perfringens* and all the aërobes except those that spore. The organisms that spore in milk survive and are transferred to a second milk culture. A slow digestion and a clearing of the milk from the cream surface downwards is due to *B. sporogenes* or some near relative of this organism. *B. sporogenes* gives rapid digestion and blackening in meat cultures.

This is the same motile microbe that has been described by recent English writers as *B. oedematis maligni*. It was actually found in 14 out of the 87 anaërobic infected cases, in 9 of which it was associated with *B. perfringens*. Its real incidence was probably much greater, because the investigation of a haemothorax often ceased on finding the stormy fermentation of the primary milk cultures.

III. *The Third or Miscellaneous Group.*

This group comprises the so-called *B. von Hibler IX*, which was found once in combination with *B. perfringens* and *B. sporogenes*; *B. aërofetidus* of Weinberg, found once only; and nine other organisms which were not identified and could not be grouped in either the *perfringens* or *sporogenes* category.

We were not able to recognize any particular clinical features as being characteristic of one or other of these forms of bacillary infection, doubtless because the infections within the chest usually contained more than one member of the group.

An investigation of the biochemical reactions of a number of pure strains of *B. perfringens* and *B. sporogenes* in culture media has been made by us in conjunction with Captain C. G. Wolf, R.A.M.C., and this has given some indication of the effects produced by these organisms individually in a haemothorax fluid. *B. perfringens* is characteristically a carbohydrate splitter. The gas it produces in a haemothorax cavity is derived chiefly from the glucose present in the original extravasated blood and in the superadded serous effusion. The amount of gas produced by a strain of *B. perfringens* from any given fermentable sugar varies considerably from time to time under artificial cultivation.

Under favourable conditions, growth in milk—that is, in a lactose-containing medium—will result in the formation of an amount of gas which may be more than twice the volume of the original culture medium, and will actually develop in twelve hours' incubation a pressure of two atmospheres, or more than 60 feet of water in the containing vessel. So high a pressure as this is never reached within the pleural cavity of a living man. The highest that we have actually measured was +15 to 20 cm., that is about 30 cm. of water above the normal intrathoracic pressure, or an increase of one-thirtieth of an atmosphere. The pressure may be so great as to drive back the piston of a glass exploring syringe and force it clean out of the barrel. The gas burns with a pale blue flame, and consists of a mixture of hydrogen and carbon dioxide, the proportions varying at different periods of the fermentation, but being approximately as two to one. Neither methane nor nitrogen are found in it.

The odour of the gas is due to the presence of traces of sulphuretted hydrogen and of certain volatile bodies produced in the degradation of the protein molecule. *B. perfringens* by itself is a feeble protein splitter *in cultures, and never* produces sulphuretted hydrogen or any offensive odour under these conditions. The smell results from a proteolytic destruction that in itself is not associated with the liberation of much gas, and hence one may meet with a most offensive and deeply haemolyzed fluid in cases where there is but little free gas (see Case IV).

In cultures outside the body these odours are met with only during the growth of protein-splitting organisms such as *B. sporogenes*, or where *B. perfringens* is mixed with other organisms. But with an infected haemothorax the gas is found to be malodorous even when bacteriological examination reports only the presence of *B. perfringens*. The explanation of this smell may be either that it proves the haemothorax in all such cases to be infected, in addition to *B. perfringens*, with some other anaërobic bacillus

that was not recognized in the rapid method of examination employed; or that *B. perfringens* can exert within the chest a proteolytic action of a nature which cannot be reproduced under the conditions of outside cultivation.

Whatever be the explanation of this difficulty, the essential fact remains that the gas is produced chiefly from carbohydrates, and, so far as that origin is concerned, is odourless, though it may be tainted by other substances derived from a bacterial proteolysis that does not liberate much gas. *The smell and the gas are separate results of an anaërobic infection of a haemothorax*, and they may appear separately.

Sulphuretted hydrogen is an extremely poisonous substance to man and it is very soluble, but it appears improbable that this malodorous body is ever produced in sufficient quantity to cause a fatal intoxication. The harmful effect of such gas as is evolved is chiefly mechanical.

The retardation of development of anaërobes after implantation in a haemothorax is such a striking feature clinically that it continually excites the hope that a fuller knowledge of the processes concerned in this resistance to the general dissemination of the bacilli may give the desired means to arrest once and for all the spread of infection from the original focus.

Laboratory experiments show the following facts:

1. Attempts to grow *B. perfringens* either in fresh whole blood, or in serum, or in old sterile haemothorax fluid, give only negative results, or meet with very scanty success.

2. If fresh serum be altered by the previous addition of trypsin to it, a medium is produced which is much more favourable to growth.

3. Blood serum obtained from the body at varying intervals after death is a medium in which *B. perfringens* will grow vigorously and almost without fail.

Therefore it follows that the cultures fail with fresh blood either because there is some body in it which inhibits growth, or because the food substance necessary for development is not presented in an accessible form. The general question has been discussed by Sir Almroth Wright,[1] in an attempted explanation of the "avalanche" growth that bursts forth when the necessary conditions are established.

Measurements made by Captain Wolf show that sterile haemothorax fluid of ten or twelve days' standing is slightly more alkaline than normal blood, and that there may be no acidosis in a fluid in which *perfringens* growth is proceeding vigorously. The nature of the facultative change is still unknown. In so much as a man, when his haemothorax is found to be sterile in its fluid part, may exhibit the clinical features of infection on the third or fourth day, it is certain that the bacilli must be growing very actively in some sheltered focus and liberating digestive products of sepsis. Presumably these products diffuse into the general pond of the fluid and alter its properties in such a way that the bacilli are enabled to follow and establish themselves abundantly.

General Clinical Features of These Infections.

The clinical features of these septic cases may be classified under three main headings:

1. Those indicating the general toxic action on the patient of the septic substances produced.
2. Those caused by inflammation of the pleural cavity.
3. The special physical signs within the chest.

Usually within three or four days after having received a wound in the chest which does not carry deep infection with it, the injured man has passed into a condition of relative ease. His dyspnoea becomes progressively less urgent; the temperature approaches normal by a smooth curve of decline, and the pulse falls to below 90. He sleeps well and his appetite returns. In every respect he is rapidly regaining the appearance of a healthy man, and each day marks an obvious step forward in that direction.

But when sepsis is present in a haemothorax the patient does not mend, and day by day each feature of uneasiness suffers increase. Sleep is broken and uncertain; the appetite fails; pain and tenderness in the affected side of the chest are complained of, and the breathing becomes more dyspnoeic; the cheeks may develop a hectic flush, and an obvious icteric tint appear in the conjunctivae. Together with these changes the face assumes a slightly anxious expression.

Restlessness, amounting to actual light delirium, by day as well as night, is noted in the most serious infections, of which it is often a very early and suggestive feature. Such delirium has no relationship to pericarditis.

The tongue may be tremulous and lightly coated with fur, though usually it shows so little change that one is often justified in the conjecture that a particular case of septic haemothorax is caused by anaërobes because the tongue is so unexpectedly clean. Other forms of infection produce either a heavy fur, or, as especially with the streptococci, a dry brown surface.

The temperature is always raised, but sometimes to so slight a degree that on this count alone it would appear idle to suspect sepsis. Indeed, the temperature is apt to be a most misleading guide if too exclusive reliance is placed upon it in searching for evidence of infection.

Increase of the pulse-rate is of greater importance. Tachycardia above 110 is rarely seen with a simple haemothorax in a patient who is free from other complications. Case VII illustrates the value of a rapid pulse-rate in raising the suspicion of sepsis in a case with very mild pyrexia. A low pulse-rate and slight fever are never seen combined in a case of anaërobic infection. On the other hand, severe infection and high fever may coexist with a pulse-rate not exceeding 90. (Cp. Case XII.)

The development of *jaundice* should be looked for with the closest attention. A sterile haemothorax may cause a slight conjunctival icterus, but nothing more. Real jaundice, especially if associated with epistaxis, has, without exception, in our experience been an index of a particularly severe type of infection by anaërobes; and not an hour should be lost in dealing with the patient when once this yellow tint has appeared.

Vomiting never occurs. Severe diarrhoea, of the offensive and uncontrollable type that may appear in any subject of old foul wounds, may be noted in patients with empyemata that have existed for many days without recognition, but it is not an early feature.

The *pleural inflammation* within the chest on the side of the haemothorax is shown by an increase in the size of the effusion and by local tenderness and pain. In most cases this pain is mild and needs inquiry to reveal it; but in a few it produces continual distress, and may even lead to a referred tenderness over the hypochondrium and abdominal rigidity, so that the surgeon is tempted to an exploratory laparotomy on the supposition that the missile has passed from the chest into the abdomen.

In cases where there is practically no haemothorax, and the infection is spreading from a focus around a splintered rib, coarse pleural friction will be heard on the side of the developing empyema. But usually it is fruitless to search on the injured side for pleural friction as a sign indicative of sepsis. On the opposite side a coarse pleurisy often develops from spread of the infection across the chest, and its recognition should always emphasize the need for exploration of the haemothorax.

Oedema of the contralateral base of the lung is also a feature suggestive of sepsis; but contralateral massive collapse may occur in either sterile or septic cases equally, and is chiefly the expression of a thick purulent secretion encumbering the airway of the bronchial passages.

Pericarditis develops in a small proportion of these infections, and is usually fatal before the effusion has attained a large size. But friction sounds heard over the cardiac area are not in themselves to be interpreted as being of invariably bad prognosis. They may be caused by a dry pericarditis, which slowly disappears in the same way as does the dry contralateral pleurisy; or they may simply be the trivial and transitory sounds that are ocasionally produced from leakage of air from the lung into the mediastinal tissues. Speaking generally, there is no special form of pericarditis associated with the anaërobic infection of the haemothorax. That which develops is similar to what is found in other forms of infection, and as a matter of fact it is generally due to streptococci or other organisms that were associated with the anaërobic bacilli in the haemothorax. The case of gaseous pneumo-haemopericardium, which was so successfully dealt with by Major Littler Jones,[2] was a rarity of which we have never seen an example in over two hundred autopsies on chest wounds at base hospitals. Occasionally frothing bubbles of gas

have been observed in a semipurulent pericardial effusion associated with anaërobic septic haemothorax; but the gas was not abundant, and there was no reason to believe that it was not entirely a *post-mortem* production. No example of a large pyo-pneumopericardium has been found by us at autopsy.

The special physical signs on the side of the haemothorax are simply those caused by the *development of gas* within it. This gas may be loculated within the haemothorax, or it may collect freely above the fluid in the pleural sac. In the latter case the signs are indistinguishable from those of an ordinary exogenous or air pneumohaemothorax; but the gas may be formed so abundantly that the heart suffers continually greater displacement, and the side of the chest may sometimes be bulged out under the internal pressure. (Cp. Case III.) In aspirating a traumatic air pneumothorax, we have never found a pressure greater than that of the atmosphere; but in these inflammatory gas collections the pressure may be as high as + 15 or + 20 cm. of water. The fluid below the gas is mobile, and its horizontal level of percussion dullness shifts when the patient is raised from the lying to a sitting posture. The anvil ("bell") sound is often yielded by the coin test.

The loculated collection of gas is almost in itself a diagnostic feature. Percussion reveals a resonant area, often with a low-pitched note that is almost "cracked-pot" in character, within the boundaries of the area of dulness that demarcate the haemothorax. The level of the latter does not change with posture, for the collection is not freely mobile. The gas producing the note is usually loculated at the back, somewhere near the angle of the scapula. It is extremely rare to meet with a similar collection of ordinary air that has escaped from a lacerated lung into a haemothorax and remained imprisoned so low down. Consequently, whenever this peculiar percussion note is met with in a haemothorax, where the cardiac displacement seems unusually great in proportion to the area of dullness and the physical signs are difficult to interpret, gas infection should be suspected, and tested for by exploration at the lower limit of the resonant area.

But there is one fallacy to be guarded against. The diaphragm on the wounded side often takes up an abnormally high position as an immediate result after the injury of some paralysis of the respiratory movement. It may be sealed up in this position by adhesions and remain elevated despite the increase of intrapleural pressure. Under such circumstances percussion over the base of the chest behind may elicit a tympanitic note from the raised abdominal viscera, on the right side as well as on the left. Therefore the preliminary diagnosis of gas should be accepted only when this abnormal note is found behind at a level above that of the ninth rib.

It is needless to discuss the differential diagnosis from pneumonia or other chest complications. The physical signs often fail to make the diagnosis secure. Safety for the patient is gained by the discarding of these dubious distinctions, by promptness to suspect infection, and by reliance on the exploring needle. In difficult cases an *x*-ray examination of the chest by fluoroscopic screen with the patient in a *sitting* posture will often lead to the solution of the problem. When mobile gas and fluid are present in the pleural cavity, the fluid will appear as a dark pool with an upper horizontal level. The surface of the free fluid shows oscillations caused by the heart-beat, and will be violently agitated if the patient coughs. Its level changes in relation to the chest wall when the patient is tilted first to one side and then to the other. Such an appearance is diagnostic of a collection of free fluid below gas or air.

REFERENCES.

[1] *Lancet*, January 6th, 1917, p. 1. [2] *British Journal of Surgery*, vol. iv, July, 1916, p. 103.

(*To be continued.*)

A COMMITTEE of superintendents of public instruction and other officials concerned with education in the United States has recently been formed to further the passage by the legislatures throughout the country of a bill, drafted by Dr. Dudley A. Sargent, the physical education expert at Harvard, for the promotion of physical training in the public schools. The committee believes that "the time has come for the adoption of a definite plan for the preparation of American boys and girls for the pursuits of peace or the vicissitudes of war."

CLINICAL OBSERVATIONS ON DYSENTERY.

BY

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THE clinical symptoms of dysentery vary greatly, and rarely do they actually conform with the usual textbook description.

The simple acute bacillary type and the simple acute amoebic type are clinical entities and no difficulty should arise in distinguishing between them clinically. It is impossible to distinguish between the various types of bacillary dysentery without the aid of the bacteriologist. Clinically they must remain in the common group.

Another type of dysentery that has come under my observation during the present war is what might be called an acute mixed type of dysentery. The clinical symptoms are at first those of the acute bacillary type, which after varying intervals merge into those of the acute or subacute amoebic type. This type of dysentery is most important from the point of view of treatment. It is to be regretted that in this note no mention can be made of the bacteriological and microscopical examination of the stools. This should be carried out as a routine measure in every case whenever possible, but the circumstances under which I have observed and treated the majority of my cases have rendered this impossible.

Incidence and Causation.

From several years' experience of active service conditions on the North-East Frontier of India, and during the present war in Egypt, Anzac, and Mesopotamia, I cannot help coming to the conclusion that in the bacillary type the main source of infection is the common house-fly.

It is a remarkable coincidence that during the first few weeks or months in any campaign in which I have taken part the prevailing type of dysentery has been the bacillary type.

During the Abor expedition on the North-East Frontier of India, while the troops were collecting at the base and were engaged in making roads for the advance, in fact were more or less stationary, and the climate was such that flies could live and breed, then the prevailing type was the bacillary type; but when the troops pushed on, had fatiguing marches to do day after day, as the season also advanced and the weather became colder and wetter and the heavy rains seriously damaged the quality of the rations, then the amoebic type of dysentery made its appearance.

Again, during the expedition into the Mishmi country on the North-East Frontier of Assam, as long as the weather was hot and flies were abundant, and as long as the troops were engaged in cutting roads through the dense jungle, and progress was necessarily slow, then the bacillary type prevailed; but as soon as the weather became colder and wetter, and the flies disappeared and the troops pushed on to the hills, then did amoebic dysentery make its appearance. Flies are by no means a heritage of modern civilization, for in this dense jungle area of over sixty square miles, which was practically devoid of any human habitations, flies were as abundant as in an Indian bazaar in the middle of the hot weather.

Deficient sanitary arrangements attract flies and also encourage their propagation, and all that is required with such conditions is a favourable climate, and dysentery is bound to make its appearance.

At the beginning of any campaign, when large bodies of men congregate in limited areas, and before the sanitary details have had time to become properly organized, it is then, as it were, that the seed for future dysentery becomes sown, and it is only with the greatest difficulty and with the most thorough measures that the coming outbreak can be arrested or checked.

Military exigencies must always in every campaign be the first consideration, and a typical example of this occurred during the landing at Anzac on April 25th, 1915, and the following few days. Fighting men had to be landed at all costs and as rapidly as possible. All other branches of the army were during this critical time of secondary importance, and it was only when the position had been captured and consolidated that sanitary and other details could be landed.

During these first few days, when every one was in

immediate danger from the enemy's fire, little consideration was or could be given to any sanitary arrangements. It was only when things had quietened down that steps could be taken. It was during this period that the seed was sown. The small area occupied by the troops had practically all become contaminated with human faecal matter, while the dead bodies of men and mules, which lay unburied for weeks in unapproachable areas, proved to be a perfect nidus for flies to breed in. The climate also was ideal, so that in the circumstances it was not surprising that a serious outbreak did occur. The limited water supply and the limited variety of the rations being also contributory causes.

Troops on service seem to be far more liable to intestinal troubles when the ration is day after day the same. The monotony in eating the same daily ration acts psychologically in that it brings about anorexia and indigestion, which lower the soldier's resistance.

With amoebic dysentery the conditions are different. It has now been shown that the *Entamoeba histolytica* frequently exists between the gums and teeth in cases of pyorrhoea alveolaris. The diphtheria bacillus can exist in the fauces of its host without causing him any inconvenience, while the presence of the cholera vibrio in the stools of an apparently healthy individual is nothing new. It is, to a large extent, the carrier problem once more. It would be an extremely interesting experiment to have the stools of, say, 100 healthy Indian soldiers carefully examined for the *Entamoeba histolytica*. Positive results would, in my opinion, be obtained in a surprising number of the stools examined.

Laboratory experiments go to prove that the common house-fly is the chief factor in conveying this form of dysentery also. However, I am convinced that in far the larger proportion of cases drinking water is the main source of infection. This form of dysentery rarely makes its appearance during the first few weeks, or possibly months, of a campaign. In my experience it only begins to show itself when the troops are beginning to become fatigued or exhausted. Amongst Indian troops on frontier expeditions long marches or hard fatigues, with continued exposure to cold and wet, are the main predisposing factors. It occurs far more frequently during the colder months than during the hotter, so that flies cannot have the same share in its propagation as they have in conveying the bacillary form. It frequently follows after an attack of bacillary dysentery; here again the soil is prepared for it.

The entamoeba is, in the greater proportion of cases, conveyed by means of drinking water. It may produce dysentery at the time, or it may lie dormant and only show its presence when its host has become debilitated, or his resistance lowered by any means.

Symptoms and Treatment.

The symptoms of dysentery vary according to the type of infection and according to the acuteness of the disease. In all forms the most important symptoms are the frequency and character of the stools and the degree of tenesmus. From these the severity and progress of each case must be judged. The temperature runs no special course, but as an aid to treatment it must not be overlooked. In severe acute cases it may run up to 104° or 105° F., while in others it may be subnormal. In the latter type of case there may be varying degrees of collapse, which should be treated accordingly.

The disease in some cases begins as simple diarrhoea; in others the onset is sudden, with frequent stools containing varying quantities of mucus and blood, with colicky pains in the abdomen. Tenderness over the descending and sigmoid colon is also a frequent sign.

In severe cases the faecal element in the stools soon disappears, and the patient passes large quantities of mucus tinged with varying proportions of blood. In some cases after a few days there may be no trace of blood to the naked eye, while the patient may pass frequent motions containing large quantities of purulent mucus.

Tenesmus as a rule is not very marked in the bacillary type, and may be absent altogether. This is the symptom which is almost characteristic of amoebic dysentery. In severe cases it may be so intense that the patient dare not leave the commode, while the pain and straining may bring on a certain degree of collapse. All the patient passes in such a condition consists of very small quantities of blood-stained mucus.

It is extremely important amongst troops that every case of diarrhoea, however mild, should be promptly treated and checked. They should, if possible, be admitted to hospital and the stools rendered innocuous. Simple diarrhoea frequently goes on to dysentery unless treated in time, especially in localities where the disease is endemic.

All cases of dysentery should have absolute rest in the recumbent position. I have found that when cases are allowed to walk about recovery is greatly delayed.

The diet should be very sparing and should consist at first of nothing but barley water or rice water, later milk may be given, but, should the milk be passed undigested, whey should be given instead or a few grains of sodium citrate added to each pint, and the result watched in each stool. The less soups and broths given the better. Koumiss or sour milk is an excellent diet and can easily be made anywhere in the East. A few spoonfuls of dhai or leban are obtained from the nearest village and put into fresh or sterilized tinned milk. It is then kept at an equable temperature for a few hours, when it is ready for use. The time varies with the degree of activity of the culture of the lactic acid bacillus obtained and the temperature at which it is maintained.

As the patient progresses, rice thoroughly boiled in water is the best solid to begin feeding with. It is easily digested and does not contain too much starchy matter like sago, arrowroot, etc. Great care should be taken with the dieting, and the importance of personally examining every stool passed by the patient cannot be sufficiently impressed. From this inspection only can the diet be regulated.

Soldiers frequently, when they are progressing favourably, complain about the meagre diet they are getting, and to supplement this sympathizing friends from the lines may attempt to supply them secretly with all kinds of indigestible foods; a relapse is the usual consequence. The medical officer by examining each stool holds the master key, and can act accordingly. Malingerers can be caught out in this manner. Instances have occurred where the patient has deliberately kept up the symptoms by eating unauthorized foods so as to be sent back towards the base.

To prevent the spread of the disease from infected stools, each stool should be protected from flies and destroyed whenever possible by incineration; should this be impossible, then it should be rendered innocuous with one of the various disinfectants.

All cases of acute dysentery coming into hospital were given 2 drachms of magnesium sulphate every two hours until the stools became faeculent or until 2 oz. had been given. This was done as a routine measure unless the dysentery was of the amoebic type.

This method of treatment with rest and dieting has proved in my experience to be most satisfactory. If there were no improvement from this, the patient was then given bismuth salicylate and salol āā 10 grains three times daily for three or four days, and at the end of this again went through a course of the magnesium sulphate treatment. This salt acts mechanically by ridding the patient of the bacterial and other débris in his intestinal canal, and possibly also by virtue of its lymphagogic action may draw into the intestinal canal any antitoxins that may have been formed in the patient's blood.

With this treatment in the field ambulance it was found possible to return to duty within fourteen days 90 per cent. of the cases of dysentery which occurred amongst the Indian troops at Anzac.

Should the patient have intense pain, hot fomentations applied to the lower part of the abdomen will frequently relieve it; otherwise 10 minims of camphorodyne or 10 grains of Dover's powder will be found to act satisfactorily.

The promiscuous injecting of emetine in every case of dysentery is distinctly harmful. The results are very disappointing, and one's faith in its specific action in amoebic dysentery is apt to be shaken. It should only be used in those cases that are distinctly amoebic in type, or in which the entamoeba has been discovered in the stools. Emetine was found to have little effect in cases of mixed dysentery until the patient had gone through a course of the saline treatment first, when it had the same

marvellous action as one observes in India in cases of simple amoebic dysentery.

The injection of emetine should not be done indiscriminately, and the result of each injection should be carefully observed. In suitable cases a grain should be injected subcutaneously night and morning. If no good results occur after four injections, it should be stopped, on account of the depressing influence it exerts. It can be resumed after a few days' interval if thought necessary.

Chronic Dysentery.

Chronic dysentery is a far more difficult and intractable condition to treat. The results of medical treatment in bad cases that have persisted for several months have proved to be very unsatisfactory. The majority of chronic cases are by no means simple infections, other intestinal micro-organisms step in as soon as the bowel becomes seriously damaged, and a state of chronic toxaemia arises.

I am indebted to Major E. F. Sealy, I.M.S., for permission to observe a large number of cases among the Turkish prisoners of war that were in his charge. From *post-mortem* examination of the large intestine in a few cases that died, my conviction that medical treatment has very little influence on the progress of the disease was verified. In practically all cases examined the whole of the large intestine was an abscess cavity with extensive ulceration and in parts total destruction of the mucous membrane. Where an attempt had been made at repair the intestinal wall had become converted into dense fibrous tissue, which would in time have formed strictures and have been liable to break down on the slightest injury. The pus, which lined the whole mucous lining, was very foul, and it was evident that the *Bacillus coli* took an active part in helping to bring about the condition. The immediate results of appendicostomy and washing out the large intestine with ordinary eusol solution were excellent. Though all cases operated on by Major Sealy and myself were in an extremely debilitated condition, and some were actually scorbutic, the shock from the operation itself was *nil*. The lavage was done night and morning through a fine rubber catheter and fully two quarts of eusol allowed to pass. The patient experienced no pain or inconvenience, and the fluid was passed by the rectum within ten minutes or so. The fluid passed cleared away all the foul débris in the large intestine, and absorption was prevented, the stools that were passed were rendered far less foul, the septic appearance of the patient improved wonderfully, and the temperature came to normal. Difficulties arose later owing to the appendix contracting and to the skin wound closing up. This operation gives good results for a time, but they are not maintained. Relapse is almost certain to occur, the reason, in my opinion, being that it does not provide the necessary rest for the large intestine.

The ideal treatment in such cases would be an ileo-colostomy with appendicostomy and lavage. It is only in this way that the bowel can have the required rest. The injection of emetine in cases in which the *Entamoeba histolytica* is proved to be present should be carried out; of its specific action on the entamoeba there is no doubt; still its action on the ulcerative and septic changes in which at this stage other organisms are taking part is *nil*.

TWO CASES OF HEART FAILURE IN THE OPERATING THEATRE TREATED BY HEART MASSAGE: RECOVERY.

BY

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THE interest that has been taken of late in heart massage, applied to the heart through the diaphragm in cases of failure of the heart and respiration while a patient is undergoing an operation, has suggested to me that the following two cases are worth recording.

It has been advised that when a patient has collapsed on the operating table, and has failed to respond to the stimuli that are usually employed, after waiting a few minutes the surgeon should start heart massage through the diaphragm. While success has crowned the operator's efforts after several minutes of waiting, it is advisable not to wait long before starting heart massage, because the patient is in desperate straits, and a delay of half a minute might mean all the difference between success and failure.

In Caes II, reported below, heart massage was started as quickly as possible when the patient did not respond to artificial respiration, and as soon as it was found that he was pulseless; and even then the first period of heart massage failed to cause the heart to contract. Had heart massage not been started promptly it seems probable that it would have been too late to do any good.

When the operation under which the patient has collapsed is not an abdominal section, naturally a surgeon is anxious not to open the abdomen if it can be avoided, owing to the risks of peritonitis following an abdominal section when there has been no time to perfect the aseptic technique. For instance, in an operation for adenoids the surgeon's hands are not sterile, for they have been in the patient's mouth, and he may not have a sterilized scalpel at hand, nor any iodine solution to paint on the skin of the abdomen. Even then I would urge that delay may mean a life lost. Such cases as these test the judgement of the most expert. When the operation has already necessitated the opening a clean abdomen, there can surely be no reason for delay.

The most common causes of sudden collapse on the operating table are: (1) Idiosyncrasy to chloroform; (2) shock from operating while anaesthesia is incomplete; (3) any operation that causes a too sudden relief of increased intra-abdominal tension.

In nearly every case of death on the operating table that has come to my knowledge chloroform has been employed. Let me, at the risk of repeating what has been written many times, urge that unless there is some special contraindication, ether should always be employed as the anaesthetic. It is very rare to hear of a death on the table under ether.

CASE I.

Four years ago a lady, aged 63, was brought to consult me because her abdomen had been getting large, and she suspected that she might be going to be confined for the first time. On examination, an ovarian tumour was diagnosed. It was of great size, impeding respiration seriously—in fact, the patient appeared to be a shell surrounding an enormous tumour. The pulse was irregular, the arteries somewhat thickened, and there was a marked aortic systolic murmur and an accentuated aortic second sound. She was told that the condition would soon be incompatible with life, and at the same time that there was a grave risk in operating on any one in her condition. She elected to have an operation.

The abdomen was opened and the tumour removed after having been aspirated with a trocar. Immediately after removal the patient collapsed. Respiration and heart stopped. After a short attempt at artificial respiration had been tried and pituitary extract had been administered without effect, the right hand was introduced through the abdominal incision, the left hand was placed over the heart, and the heart massaged by a series of rhythmic squeezes at the rate of forty or fifty a minute; the right hand compressing the heart through the diaphragm against the chest wall was reinforced by pressure on the outside of the chest by the left hand. Meanwhile artificial breathing was continued. After a short time the heart commenced to beat, respiration was restored, and the patient made a rapid recovery. Ether was the anaesthetic employed. The collapse was due to sudden relief of intra-abdominal pressure. The ovarian tumour was so large that it took two people to lift it off the table.

CASE II.

On January 10th, 1917, I was operating on a man for appendicitis. The abdomen had just been opened, and the man suddenly collapsed. Respiration and pulse were negative. The incision was rapidly enlarged, and the right hand introduced. The heart felt absolutely flabby, not a sign of contraction. Massage was started as in Case I, and artificial respiration continued. After about one minute, massage was stopped to see if the heart would contract. It would not. Massage was commenced again, and after about another minute the heart commenced to beat feebly. Pituitary extract and strychnine were injected, and after about five minutes the patient's condition improved so much that it was decided to complete the operation, as the appendix was distended and contained pus. His colour remained rather bad most of the day, and the pulse was irregular, but after continuous saline and adrenalin by the rectum, his condition in the evening caused no anxiety, and he made a good recovery. The anaesthetic used was a mixture of chloroform and ether before the collapse, and ether subsequently.

THE RELATION OF PERIDENTAL GINGIVITIS TO VINCENT'S ANGINA.*

BY

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AND

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TEMPORARY CAPTAIN R.A.M.C.

THAT ulcero-membranous inflammatory affections of the buccal cavity may be widely distributed on the mucous membranes of the mouth and gums, and not confined to the pharynx and tonsil in accordance with the classical descriptions of Vincent's angina, has been recognized by many observers since this was pointed out by Vincent himself in 1898. In addition to an ulcero-membranous pharyngitis and tonsillitis (Vincent's angina), he described an ulcero-membranous stomatitis and an ulcero-membranous gingivitis. In all these conditions, two or more of which are not uncommonly seen in the same patient, he found that the same micro-organisms were present—namely, the spirillum and *B. fusiformis* (Vincent).

Although Vincent's name is usually attached to these organisms they would appear to have been first seen and described by Miller, an American dental surgeon, in 1882.

In the Queen Alexandra Military Hospital during the last few months we have examined bacteriologically nearly 300 cases of fuso spirillary infection of the mouth, and have abundantly verified the constant presence of these organisms in all forms of ulcero-membranous inflammation of the mouth, either alone or associated with various forms of cocci, bacilli, and leptothrices.

In addition to the diffuse ulcero-membranous gingivitis previously described by Vincent and others, which is frequently found in association with Vincent's angina, there is frequently met with a more restricted infection of the gums with these fusiform and spirillary organisms, in which the lesions are limited to those parts of the gums which are in immediate contact with the necks of the teeth. This condition constitutes, we believe, a distinct clinical entity, and may accurately be designated fuso-spirillary peridental or marginal gingivitis—a condition named and described by us in a paper read before the Odontological Section of the Royal Society of Medicine on November 27th, 1916.

In addition to its prevalence this affection is of interest and importance in that it is often confused with pyorrhœa alveolaris, although it differs in the absence of pus and pus pockets. Further, the treatment, course, duration, and prognosis of the two affections are essentially differential.

In our earlier examinations of cases of Vincent's angina the investigations were restricted to the ulcero-membranous lesions of the pharynx and to the differential diagnosis of the condition from other ulcerative membranous infections, particularly diphtheria and syphilis.

Later the ulcero-membranous lesions were found not to be confined to the pharynx, and many cases of fuso-spirillary gingivitis were observed often associated with the typical Vincent's angina.

It is, however, the restricted peridental or marginal gingivitis which we have particularly found associated with Vincent's angina, although in a few cases the accompanying gingivitis was of a more diffuse character.

Since our attention was first directed to this association of peridental gingivitis and Vincent's angina we have made a systematic examination of the gums of 70 cases of Vincent's angina, and in every case, without a single exception, we found the gums to be affected, the condition in the great majority of these cases being a localized peridental or marginal gingivitis.

Conversely, out of 150 cases of fuso-spirillary gingivitis the characteristic lesions of Vincent's angina were present in the pharynx or tonsils in 70. In all these cases the clinical findings were confirmed by careful bacteriological examination.

An investigation of the histories of the cases showed the same sequence of events in them all—namely, that the gums were always infected first, and that the sore throat was the more recent condition, having been infected, it would seem, from the gums. In many cases the patients themselves would make no complaint about the gums, but on inquiry it would be found that the gums had been sore and bled more or less freely whenever an attempt was made to use a toothbrush or clean the teeth.

This condition of the gums may have been present for days or weeks, or even months, and in a few cases years before infection of the tonsil or pharynx supervenes.

In some of these cases of peridental gingivitis the patients had frequently suffered from attacks of sore throat, and examination in these cases usually revealed evidences of old ulceration of the tonsils or pharynx with loss of tissues, deep crater-like depressions in these organs being often found. In this connexion the following are interesting and instructive histories:

CASE I.

Second Lieutenant D., Lovat's Scouts, presented himself for treatment suffering from Vincent's angina of the left tonsil. Peridental ulceration of the gums was also present about the lower incisors. The teeth were sound, clean, and in good condition. After two weeks' treatment of the topical application of an alkaline solution of salvarsan the throat was quite healed and the condition of the marginal gingivitis was much improved, though slight bleeding of the gums when touched still persisted, and fusiform bacilli were still present though in greatly reduced numbers.

Owing to the fact that he was then recalled to his regiment no further treatment was undertaken. About the middle of November the right tonsil became sore and painful.

The regimental officer applied boro-glyceride, tincture of iodine, and other solutions, without success, and so referred the patient back to us on December 5th. We found a deep ulcer on the right tonsil, and a relapse of the peridental ulceration about the lower molars. Smears made from both the throat and the gums showed the usual picture of fusiform bacilli and spirilla. Swabbing the throat and gums with salvarsan solution was again regularly undertaken, and by December 18th the throat was completely healed.

On December 22nd the organisms had disappeared from the alveolar margins and there has been no recurrence either in the pharynx or the gums.

CASE II.

Pte. B., A.I.F., complained of sore throat, and two deep ulcers were found on the right tonsil. A soft whitish membranous exudation covered the ulcerated surface, and could readily be removed with a throat swab or platinum loop. This slight manipulation was sufficient to excite somewhat free bleeding. The throat had been sore for two days, and great pain on swallowing was experienced. The breath was fetid and the lymphatic glands beneath the left angle of the lower jaw were swollen and tender.

The gums also showed peridental gingivitis about the lower incisors. On cross-examination it was found that bleeding of the gums had been present for the last two years. The teeth were in good order, the first and second left upper molars having solid fillings. Smears from both the gums and throat showed the presence of fusiform bacilli and spirilla.

The teeth were thoroughly cleaned by the dentist, and the gums and throat were then painted daily with salvarsan solution. By November 22nd the condition of the throat was greatly improved and no bleeding occurred on instrumentation of the gums. On December 6th the throat was well and the gums were nearly healed. On December 15th both throat and gums were free from Vincent's organisms.

CASE III.

Pte. C. was sent for the bacteriological investigation of a sore throat of four days' duration. An ulcero-membranous inflammation of the right tonsil was found. The gums had been tender and bleeding for a week. Smears prepared both from the tonsil and the tooth margins of the gums showed typical *fusiformis* and spirilla. In ten days the throat was healed and free from these organisms, and a week later the peridental gingivitis was healed and the tooth margins of the gums were free from the organisms.

CASE IV.

Capt. K., R.A.M.C., complained of sore throat of three days' duration and of bleeding sore gums of three weeks' duration. The sore throat was a typical Vincent's angina and the sore gums typical peridental gingivitis. The characteristic organisms were present in both conditions.

These few cases may be taken as examples of many which we are encountering daily, and the histories of the cases keep repeating the same sequence of events with monotonous regularity. First the bleeding sore gums, which may or may not have been diagnosed as pyorrhœa, and which may have been present for some considerable time, and then the throat becomes affected, and the typical ulcero-membranous pharyngitis and tonsillitis of Vincent's

* A paper read before the Royal Society of Medicine (Laryngological Section), February 2nd, 1917.

angina is seen. The diagnosis is confirmed by finding the typical organisms in both conditions.

Our experience has been confined to adults, but Vincent's angina is also seen in children, and it would be interesting to learn if the same frequency of peridental gingivitis is observed in association with Vincent's angina in children, and whether in them the same sequence of events—namely, the peridental gingivitis preceding the Vincent's angina—also occurs.

As the result of our investigations we suggest that when a patient complains of a sore throat which presents the characters of Vincent's angina it is essential to examine the tooth margins for evidence of peridental gingivitis or pyorrhoea, and that smears be made from both sources for the detection of the causal organisms. When found to be present, the peridental gingivitis should be adequately treated as well as the Vincent's angina; otherwise the condition is likely to persist indefinitely and to cause repeated recurrence of the sore throat.

ABDOMINAL KNEADING IN THE TREATMENT OF INTESTINAL STASIS.

By JOSEPH S. BOLTON, M.D.,
NOTTINGHAM.

DELAY in the passage of food through the large intestine is a potent cause of disease, and treatment by removal of a portion of the bowel is a very severe remedy, only to be resorted to if simpler measures fail.

The causes of intestinal stasis are numerous, but one of the most important is the anatomical construction which makes it necessary that in the first section of the large intestine the food should travel against gravitation and at the summit of the ascent turn the sharp corner of the hepatic flexure; and this just at the spot where in women it comes under the pressure of the corset. The difficulty of transit is increased by the fact that, whereas the contained food is in a semi-liquid state in the stomach and small intestine, it has become semi-solid in the colon owing to the absorption of moisture.

Then, again, the passage from a tube of small calibre such as the small intestine into a large elastic pouch like the caecum tends to favour delay. The normal time for the passage of food through the stomach and small intestine, a distance of twenty feet, is about twelve hours, while it takes another twelve hours to accomplish the journey through the five feet of large intestine.

These causes are present in the normal individual, but there are also morbid causes, such as sagging of the transverse colon, and adhesions, with the resulting kinks demonstrated by the *x*-ray meal.

That it is important to prevent the stasis of food in the large intestine is shown by the relief obtained through the use of purgatives and paraffin, and the popularity of the douche for washing out the large bowel.

It is to supplement these remedies that abdominal kneading is recommended. The patient, after being carefully instructed, can carry out this treatment for herself. Lying in a warm bed, in a comfortable position on the back, so as to relax as far as possible the abdominal muscles, she must place both warm hands, with the fingers flat, upon the abdomen over the position of the caecum. Gentle but firm pressure must now be made, gradually getting deeper and deeper as the muscles relax and the contents give way. The pressure must be made backwards and upwards, and must be continued at this spot for at least two minutes. The contents cannot be easily driven back into the small intestine, and will therefore be impelled forward. The hands, still pressing deeply, are made to follow the contents up the line of the ascending colon.

The next movement has for its object to assist the passage round the hepatic flexure. For this purpose the fingers of the right hand are placed at the right loin, in the cleft between the lower ribs and the hip-bone, and pressed firmly forward. The left hand is placed at a corresponding spot on the front of the body and pressure brought to bear so that the bowel is squeezed between the two hands and emptied of its contents. The pressure may be relaxed and repeated several times. The gall bladder must now be manipulated. The tips of the fingers of both hands are forced under the ribs at the position of this viscus and pressure brought to bear upon the fundus. A very efficient instrument for this treatment of the gall bladder is the electric vibrator.

Deep kneading is now applied over the transverse colon, pressing towards the spleen. The splenic flexure is treated in the same way as the hepatic, but it is far less important. Indeed, the only other important part to treat is the sigmoid flexure, and here the pressure must be exerted downward. The patient should treat herself after getting to bed at night and again before rising in the morning, spending fifteen to twenty minutes in the process. Steady pressure and great patience are necessary if any success is to be obtained. Much of the treatment recommended can be carried out by the use of a heavy ball of shot, which is very slowly rolled over the abdomen following the direction of the large intestine.

The most obvious effect of the kneading is the passage of flatus which usually occurs while the treatment is in progress. This is frequently followed later on by an action of the bowels.

In deciding what cases require this treatment, one naturally thinks first of constipation, biliary catarrh, and dyspepsia. But intestinal stasis is often present where it is not suspected, and a careful examination of the abdomen should be made in every case of chronic illness. It may be at once obvious on inspection that the right side of the abdomen is more distended than the left. Through the parietes of elderly women elevations can sometimes be seen showing the position of lumps of hardened faeces beneath. Palpation will clear up any uncertainty in the diagnosis. Of 156 patients in whom the abdomen was examined at the Electro-Medical Hospital, Nottingham, tenderness over the caecum was present in one-third. Most of these were suffering from some form of rheumatism or from neuritis. In many the tenderness disappeared after a short course of treatment, and in none did any harm arise from the kneading and electricity applied.

In elderly persons in whom the tone of the muscular fibre is lost, difficulty is experienced in bringing about a healthy action of the bowels; they suffer from chronic retention, and when the bowels are relieved by purgatives there is inability to retain the liquid motion. For these cases abdominal kneading with electricity is useful.

Many persons in ordinary health are subject to occasional attacks of heaviness or depression. They arrive at their office only to find that the head is not clear and work is an effort. Let them lie on a couch and carry out abdominal kneading. In the course of an hour the head will become clear and all the unpleasant depression pass away. Early morning headache is caused by poisons absorbed from the abdomen, and is relieved by kneading, even when there is no constipation. Diarrhoea is due in many cases to fermentation in the caecum. The overflow gives the mistaken impression that there is no stasis. Kneading is often of service in this condition. No case of mucous colitis should be considered incurable until kneading has been thoroughly tried, while paraffin is being given internally.

A very troublesome condition, often accompanied with much pain, is that due to adhesions following operations on the abdomen. Kneading, with radiant heat and electrical treatment, will bring about a good result if persevered with.

It is not in chronic diseases only that this treatment is useful; the doctor called in to an emergency case of flatulent colic can relieve his patient in a few minutes by this method.

THE United States Public Health Service in a recent bulletin states that garment workers, particularly pressers and ironers, are subject to chronic poisoning by carbon monoxide gas, discharged into the air of workshops by gas-heated appliances. In 11.8 per cent. of the shops examined in New York City the amount of carbon monoxide was found to be excessive; in 38 per cent. the smell of gas was perceptible. Fifty per cent. of the shops used ordinary gas irons only; 41.8 per cent. used irons heated by a mixture of gas and air under pressure. Only 2.4 per cent. used electric irons exclusively, and in 8.6 per cent. defective gas irons were found. Examination of the gas tubes showed that none were gas-tight.

EARLY COMPLICATIONS RESULTING FROM RETAINED BONE FRAGMENTS IN A CASE OF GUNSHOT WOUND OF THE HEAD.

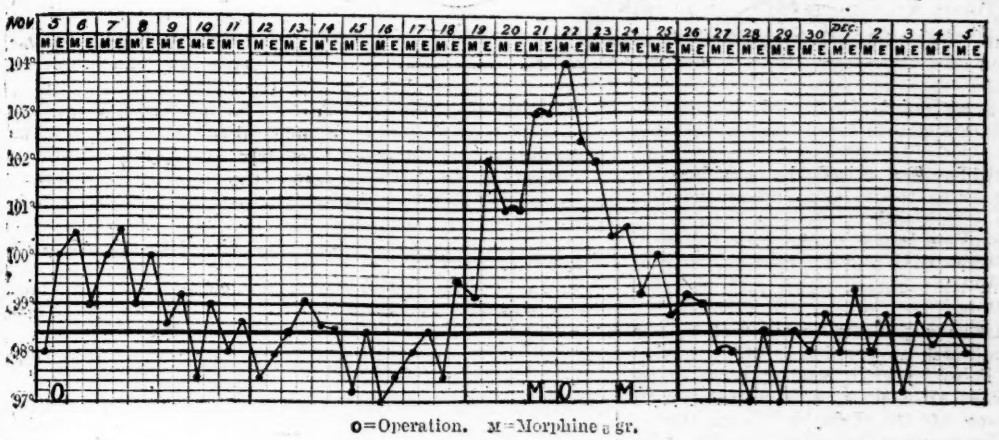
BY CAPTAIN W. E. TYNDALL, R.A.M.C.(S.R.).

THE following case of gunshot wound of the head presented some features of interest:

Pte. G. was admitted in the early morning of November 5th suffering from bullet wound of the head. He was unconscious and collapsed; the pulse was imperceptible, temperature subnormal, and respirations shallow. He was very cold and evidently suffering from shock. The scalp wound was about 3 inches long, of the gutter type, and lay antero-posteriorly in the left parietal region. It was very dirty and jagged, with blood clot and brain tissue escaping from it. His right arm and right leg were paralysed.

First Operation.

He was put to bed, infused subcutaneously with normal saline, and the wound was dressed. In the evening his condition had improved and it was decided to operate. Under chloroform the edges of the wound were excised, the wound was well washed with normal saline and explored. There was a fissure fracture 2 in. long in the left parietal bone, about 1½ in. below the superior longitudinal sinus, with two fissures radiating from its posterior end; the dura was lacerated and the brain tissue oedematous and broken down. The brain was explored by finger, half a dozen small bits of bone were removed, and the edges of the wound in the cranium were cut away to expose the free edges of the dura. The wound was washed with normal saline and closed by suture. A flap had to be cut from the upper surface (Wallace method) to allow the edges to be brought together. A rubber drain was placed under the flap down to the opening in the dura and left for twenty-four hours.



O=Operation. M=Morphine ⅛ gr.

Next morning the patient's condition was much improved, and he recovered consciousness towards evening.

He continued to improve, and eleven days after the operation all signs of paralysis had disappeared. The wound had healed by first intention, the edges of the flap were covered by healthy granulations, and there were no signs of hernia cerebri. He was able to sit up in bed and untie his bandages, and was shown "fit for evacuation."

On the evening of November 17th he complained of frontal headache, but was relieved by aspirin. He slept well during the night, but on the evening of November 18th there was a slight rise of temperature, and he again complained of headache. The following day he was drowsy, lay on his right side, his head covered and bent on his chest, his legs drawn up, and frequently complained of the pain in his head. This condition continued for the next four days.

During the night of November 21st his temperature rose to 104° F., and in the morning he was very dull and apathetic, but showed no definite symptoms. He vomited about midday. There was no optic neuritis, and the pupils were normal. There was no hernia nor increased pressure in his wound.

Second Operation.

Lumbar puncture showed slightly increased pressure; the cerebro-spinal fluid was examined by Captain Buckell, pathologist, who reported:

"Cerebro-spinal fluid is turbid; total white cells 200 per c.cm.; polymorph leucocytes 91 per cent.; lymphocytes 9 per cent. No organisms seen on direct examination. Cultures on trypagar and trypsin agar both sterile."

A small incision was made along the line of union of the original wound, from which a little clear fluid escaped. There was a slight hernia of the brain outside the dura, but not above the level of the cranium. In the hernia there was a small opening, which led into a cavity about the size of a walnut. This cavity was full of clear fluid, and lying in it were two small pieces of bone ⅛ in. by ¼ in. These were removed and the wound sutured; a drain was left in for twenty-four hours.

The next day the patient was better, but was still dull and complaining of slight headache.

Recovery was gradual, with occasional headache. He was evacuated to the base a fortnight after the second operation. He was then quite well, showing no effects of his injury. The report received from the base previous to his evacuation to England stated that "there were no ill effects from head injury observed while patient was in this hospital. No symptoms."

The necessity for the examination of the brain for foreign bodies, and their removal, is a subject of some controversy among the surgeons who are working in clearing stations. In their report on gunshot wounds of the head Lieutenant-Colonels Holmes and Sargent[1] state:

> It seems extremely doubtful if surgical intervention other than that necessary for the drainage and the healing of the wounds diminishes appreciably the risk of later complications or can modify except in a harmful direction the course of these cases from the functional standpoint.

Our records also show that many patients with foreign bodies lodged deeply in the brain recover, and are scarcely more liable to serious complications than men in whom the brain has been merely exposed and lacerated.

In the case here reported the patient was making an excellent recovery until he was interrupted by a serious relapse, which was relieved by the second operation. If the pieces of bone which were then removed were the cause of the relapse—and this seems a fair conclusion—it points to the necessity for removal of any such foreign bodies at the first opportunity. If this course had been carried out at the first operation the case would probably have made an uncomplicated recovery.

I should like to express my thanks to Lieutenant-Colonel H. H. Norman, R.A.M.C., for permission to publish this case, and to Captain Richards, D.S.O., for his advice and help.

REFERENCE.

[1] *Journal of the Royal Army Medical Corps*, September, 1916.

COMBINED SUSPENSION AND EXTENSION APPARATUS FOR COMPOUND FRACTURES ABOUT THE HIP.

BY G. M. HODGES, M.B., B.S.LOND.,
LATE TEMPORARY CAPTAIN R.A.M.C.

SEVERE wounds of the buttocks and wounds of the upper third of the thigh, with high fracture of the femur, unfortunately common in this war, are among the most unsatisfactory that the surgeon has to deal with and the most distressing to the wounded themselves.

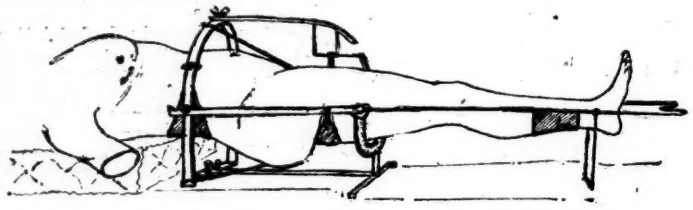
As regards buttock wounds, the patients from choice will always lie on their faces; this is the position in which they are sent from the field ambulances to the casualty clearing stations, and at this early stage it is certainly the best. But when, as invariably happens in shell wounds of this region, sepsis is firmly established, the advantages of dependent drainage practically necessitate the patient lying on his back. Pressure on the wound thus produced retards healing and often causes almost intolerable pain. In addition, it makes the dressing of the wound difficult, tedious, and painful, while the same may be said of the use of the bedpan, care of the back, and other details of nursing. Especially is this so when fracture of the sacrum, ischium, or upper extremity of the femur is a

complication. The frequent movement of these fractures for dressing, etc., are, of course, both painful and surgically bad.

Wounds of the upper third of the thigh with fracture of the femur may commonly be put up in a Thomas's leg splint (slung and abducted) quite satisfactorily, but too often the ring of the splint covers some area of the wound, and it is not easy to transport cases thus put up by ambulance train without much harmful and painful movement of the fracture.

The various modifications of the Thomas we have found quite unsatisfactory. The half-ring, for instance, may not press on or cover the wound area, but the splint is extraordinarily difficult to keep in position when the patient is in a bed; during transport it is nearly impossible.

A Jones's abduction frame meets the difficulty when there is an anterior wound only, but when, as generally happens, there is a through-and-through wound, of which entrance or exit is posterior, this is in contact with the padded frame, and is difficult or impossible to dress. The frame has other disadvantages from the army point of view—it is cumbersome and takes up much space in supply trains, and it is expensive.



Experience of these difficulties raised the consideration whether it was not possible to devise an apparatus that should be efficient as a splint and yet be comfortable for the patient; allow free access to the wound and facilitate nursing; be simple of structure and application, easy of transportation when in use; cheap, light, and portable when packed.

We claim that all these requirements are met by the Hodges-Lockwood combined suspension and extension apparatus described below, which was elaborated by Captain A. L. Lockwood, R.A.M.C., and myself, with the very able assistance of Mr. Price, of Down Bros., by whom the splint was made to order of the War Office.

1. As a splint good extension is obtained and also fixation, the loin sling tending to prevent slewing of the body, while abduction can be made to any extent required. It can be adapted to either side.

2. It is perfectly comfortable.

3. Its advantages in dressing and draining of posterior wounds are obvious, and as these are not pressed upon there is an improved chance of rapid healing and less pain to the patient, especially as he does not require moving for any purpose. The use of the bedpan, etc., is easy.

4. Once the patient is in the splint he can be moved on to an army stretcher, which the splint is made to fit, and to which it can be firmly fixed. In this way he can be transported by ambulance or by train to the base, or by ship to England without in any way disturbing his fracture.

5. Packed, the splint measures 36 in. by 36 in. by 9 in. Its lightness, simplicity of structure and application, will be obvious from the following description, which is issued with the splint.

The splint consists of an iron cradle which is passed round the patient at about the level of the umbilicus. At right angles to this cradle is attached a second cradle which passes vertically between the patient's thighs. To this again is fixed (1) a cross-bar to give support when the apparatus is on a stretcher, and (2) a modified form of Thomas's leg splint supported at the foot end by a folding upright. This leg splint (made to fold for purposes of packing) is attached to the transverse cradle on the outer side by a short bar, adjustable as to length, and to the second cradle by a slotted bracket and thumbscrew. A stout canvas sling is attached to the transverse cradle by straps and buckles, and suspends the patient's lumbar region and perhaps just the upper part of the sacrum.

A second sling is attached to the second cradle and to the outer adjustable bar to take the weight of the thigh just below the natal fold.

A third sling is fixed to the leg splint near the foot.

The head, shoulders, and opposite leg being suitably supported, the patient can be raised by means of these slings 6 in. or more above the bed.

Fixation is obtained by means of a padded perineal band strapped to the transverse cradle above and below him.

Extension is obtained in the way usual on a Thomas's leg splint.

Abduction.—By the adjustment of the short outer bar any required abduction can be obtained.

The diagram shows the patient with apparatus in position.

Method of Application.

1. Place the transverse cradle in position at about the level of the umbilicus, passing it over the patient's head and shoulders.

2. Push the second cradle into position, passing it between the patient's thighs as shown in diagram, and fix above and below to the transverse cradle by the thumbscrews—but *not* tightly.

3. Slide the leg splint under the limb and attach the semicircular ring to the second cradle.

4. Fix the short outer bar in position (roughly).

5. Raise the patient by means of the slings, at the same time supporting the head, shoulders, and opposite limb on pillows or half mattresses (biscuits).

6. Fix the perineal band.

7. Apply the necessary extension.

8. Abduct the limb as required by adjusting the short outer bar.

9. Tighten the thumbscrews connecting the two cradles.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

RECURRENCE OR REDEPOSIT OF CANCER: WHICH?

In your issue of March 24th Mr. Mansell Moullin relates the case of a lady upon whom he performed gastrectomy for carcinoma of the stomach, and who died "seven and a half years after the original operation, for seven of which she had enjoyed perfect health." He states that "the whole liver was full of small nodules of an unmistakable character." I should like to add very brief notes of two cases of late recurrence or redeposit of laryngeal cancer.

The first was a man who had an epithelioma of the left vocal cord. The diagnosis was confirmed by Sir Felix Semon, and by microscopic examination after operation. I removed the growth by laryngofissure, and the patient enjoyed perfect health for thirteen years. I was then called to see him one evening because of urgent dyspnoea. He was cyanosed, laryngeal stridor was very obvious, and both lungs were congested. It was obvious that while an immediate tracheotomy might prolong life, it was improbable that it would be successful owing to the serious condition of his general symptoms. A tube was inserted, but the patient died a few hours afterwards. Permission was obtained to remove the larynx only. This showed that the scar of the original operation was perfectly healthy, while a fresh cancer had developed in the right, or originally healthy, cord, and that this growth had been the cause of the final laryngeal obstruction. The specimen is in the museum of University College Hospital, and further details of the case may be found in the *Journal of Laryngology* (September, 1903, p. 473).

The second case was originally operated on by Sir Felix Semon for malignant disease of the left vocal cord, and fourteen years later (after Sir Felix had retired from practice) the patient was referred to me for increasing dyspnoea. The larynx was reopened (laryngofissure) and I found such extensive recurrence that in view of the patient's age and general condition only as much of the disease was removed as seemed possible at the time, and the tracheal cannula was allowed to remain. In the course of a few months the growth spread into the trachea, appeared around the tracheotomy opening and assumed such dimensions that a long spiral König's cannula was necessary to reach below the cancerous mass in the windpipe. Eventually he died from pulmonary complications. Here again we have a patient who enjoyed perfect health and immunity from his disease for nearly fourteen years after the primary operation.

I have records of three other cases in which recurrence

of laryngeal cancer took place nine, seven, and seven years respectively after operation.

In reading the statistics of the results of operations for cancer in different parts of the body it has often been assumed that if there is no recurrence within three years the disease has been cured. Such experiences as Mr. Moullin's and my own unfortunately do not warrant such optimism, although at present no method of treatment other than radical intervention in early cases of cancer offers anything like the same prospect of a long immunity. This is particularly the case with laryngeal cancer if the disease is limited to the vocal cords or to their immediate vicinity, because the lymphatic connexion with surrounding regions is fortunately very restricted.

As to the light in which we are to regard such experiences opinions will differ very widely. In my first case a growth appeared on one vocal cord and was removed. The patient lived for thirteen years and then died as a result of a similar disease in the opposite cord. It is improbable that at the primary operation cancer cells were detached and infected the healthy cord, but laid dormant there for thirteen years. Is it possible that the primary growth confers an immunity on the patient, and that the period of this depends on certain constitutional predisposing factors of which we have at present little or no knowledge?

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Reports of Societies.

RE-EDUCATION OF ATTENTIVE CONTROL.

AT a meeting of the Association of Registered Medical Women on March 13th, when Dr. HELEN BOYLE was in the chair, Dr. MARY BELL, in a paper on some modern methods of re-education of attentive control used in the treatment of the functional neuroses, said that children and many adults had no power of selective attention and could not concentrate on any one thing for long. In mature age those stimuli had generally been selected which were connected with one or more so-called permanent interests and attention had grown irresponsive to the rest. The level of consciousness varied in different people and in the same person at different times, being lowest in fatigue. Some people were aware of so many sensory stimuli within and without their own bodies that life became a burden to them, and they tended to become increasingly self-centred. Many were unable to concentrate on a simple exercise for more than three-quarters of a minute. A large variety of exercises were used in the treatment; at first two minutes were allowed for an exercise, followed by varied exercises calling forth different faculties for ten to fifteen minutes. Any simple exercise would do, provided it could not be carried out mechanically—thus, a right-handed person might learn to write with his left hand or to do looking-glass writing, etc. Ordinary reading was of no use, but the patient could be made to read upside down. Exercises were given for fixing the attention on co-ordinating muscles and for training the observation. Some patients did better with a subjective type of exercise such as controlled breathing, visualizing words and numbers. Patients tended to be bored at first, and at every pause to talk about themselves, but in a few days they became interested in their progress. The whole day was mapped out, first by the physician, and later by the patients themselves; they walked, gardened, dusted, cleaned motors, played patience, etc. It was good to include some distasteful work in order to develop the power of forgetting themselves. Dr. Bell described some cases of chronic invalids who had been cured by this method and were now doing useful work. Dr. HELEN BOYLE thought patients might be made too conscious of trying to improve themselves by these modern methods. As depression was a very common element, it was important to give encouragement and allow them to do the things they enjoyed rather than those they disliked, by which means a greater concentration on external things was likely to be secured.

Reviews.

GRANULOMA VENEREUM.

VENEREAL GRANULOMA is one of the many names given to a chronic ulcerative affection of the skin about the genital organs, occurring in tropical and subtropical countries. An account of some recent investigations of its etiology, occurrence, and treatment, made by Dr. H. C. DE SOUZA ARAUJO, of Rio de Janeiro, was published in the BRITISH MEDICAL JOURNAL of July 29th, 1916 (page 146). A description of a case of the disease, acquired on the Gold Coast, and treated at the Albert Docks Hospital in London by Drs. G. C. Low and H. B. Newham, is given in the BRITISH MEDICAL JOURNAL of September 16th, 1916 (page 387). Quite recently Dr. de Souza Araujo has published at Rio de Janeiro a full account[1] of venereal granuloma, in a book which may be regarded as an extension and completion of his inaugural thesis mentioned above. This new work, which was presented at the first Medical Congress held at S. Paulo in December, 1916, contains eight chapters, and is throughout very fully documented with references to the literature of the subject. The first chapter describes *inter alia* the geographical distribution of the disease, which has been seen in England, Germany, Portugal, various parts of Africa, and North America; it is endemic in Asia, and is comparatively common in Australia, South America, and Oceania. The second chapter deals with the etiology and pathogenesis of venereal granuloma. The author concludes that it is due to a capsulated bacillus discovered by C. Donovan in 1905, and named *Calymmatobacterium granulomatis* by Aragao and Vianna in 1912. It may be added that other microbes of the new genus *Calymmatobacterium* are Friedländer's bacillus, the bacilli of rhinoscleroma and ozaena, the *B. lactis aërogenes*, and other capsulated organisms. The disease rarely attacks children or persons more than 40 years old; the primary infection habitually takes place by direct contact during coitus through cracks or erosions of the skin. The disease is not disseminated by the blood or the lymph channels, but spreads by contiguity of tissues or autoinoculation. A full account of the bacteriology of venereal granuloma is given. The specific microbe is described as capsulated, non-motile, Gram-negative, non-spore-forming, unable to liquefy gelatine or to coagulate milk. The organism was first cultivated in 1912 by Aragao and Vianna, and is polymorphic, occurring as cocci and bacilli, diplococci, diplobacilli, and filaments, all with a mucous capsule, whether in the tissues or in artificial cultures. It retains its virulence for experimental animals, at any rate as far as the hundredth subculture on gelatine; the virulence can be increased by the method of passage through animals up to a certain point. The experimental study of venereal granuloma began in 1896 with the unsuccessful attempts of Conyers and Daniels to inoculate guinea-pigs with infective material from cases of the disease in British Guiana. Aragao has employed rabbits, guinea-pigs, rats, marmosets (*Hapale penicillata*), and dogs in his experiments. Death due to *C. granulomatis* septicaemia usually occurs in twenty-four to forty-eight hours after intraperitoneal inoculation and sometimes after subcutaneous inoculation. The account of the pathological histology of venereal granuloma is illustrated with microphotographs and coloured plates; the disease begins in the corium, which becomes extensively infiltrated with plasma cells, particularly in the papillary and Malpighian layers. The plasmomas thus formed presently break down, with ulceration of the skin, which spreads widely but not deeply. Spindle cells and mast cells are not abundantly present; newly formed connective tissue is found in the older cutaneous lesions with numerous capillaries, forming nodular outgrowths and later scar tissue, which contracts. No giant cells are seen. The specific bacterium can be seen in sections stained with Unna's polychrome blue or Giemsa's stain; taking the form of intracellular or extracellular cocci, diplococci,

[1] *Granuloma Venéreo*. Trabalho do Instituto Oswaldo Cruz. Prefaciado pelo Dr. Fernando Terra, apresentado ao primeiro Congresso-Medico-Paulista. By Dr. H. C. de Souza Araujo. Rio de Janeiro: Companhia Lithographica Ferreira Pinto. 1917. (Imp. 8vo, pp. 246, with 7 coloured plates and 40 figures in the text. Price, 10 dols.)

chains, or zoogloeal masses, encapsulated and staining more or less well. The plasma cells often show hyaline degeneration when they contain the specific organism. The histological lesions found in experimental animals infected with *C. granulomatis* are those of a bacillaemia. The clinical study of the disease is illustrated by photographs and three admirable coloured plates. From the clinical point of view the author describes (1) ulcerating and (2) hypertrophic forms of the infection, which either have or have not serpiginous outlines; and (3) a mixed or ulcero-hypertrophic form. The complications met with are those due to secondary infections, generalized tuberculosis, or ulceration into the abdominal cavity, bladder, vagina, or rectum. Recurrence of the disease may be seen even after the treatment by intravenous injections of tartar emetic described below; but it is rare after this treatment, and may be due to reinfection rather than relapse. The diagnosis of the disease should be clinched by the microscopic examination of an excised portion or scraping of the diseased tissue. Of the various methods of treatment that have been employed, only two have proved serviceable—namely, the *x* rays, first used by Macleod in 1907, and injections of tartar emetic. The author has employed the latter for two years with very satisfactory results. The lesions are dressed twice daily with compresses soaked in a 1 per cent. solution of tartar emetic dissolved in normal saline; if this proves too strong and provokes local irritation, a solution of tartar emetic only half as strong is to be tried. Such dressings are of undoubted benefit; but they should be combined with intravenous injections of 5 c.cm. of the 1 per cent. solution in normal saline, given daily or on alternate days. The quantity of the injection can be increased cautiously to 6, 7, or 10 c.cm., or even 12 c.cm. in tolerant individuals; the injections are better borne by men than by women. Sialorrhoea is common with this treatment, and too large doses produce painful but not alarming reactions. Full details of the preparation and use of the solution for these injections are given. An account, illustrated with seventeen photographs, is given of cases treated by the author and his colleagues; of his own 23 cases of the disease 19 had the tartar emetic treatment, and apparently none of these had relapsed. However, one of the patients had been cured of the disease by Aragao and Vianna in 1913, with a series of twenty-two of these intravenous injections containing in all 2.03 grams of tartar emetic; two years later relapse (or reinfection) had occurred, and the patient was again cured of the disease by tartar emetic and *x*-ray treatments combined in July, 1915. The book ends with a bibliography containing 154 references to the literature of venereal granuloma.

Comparison of the photographs of the lesions in his cases with those printed by Dr. H. Tucker in a recent issue of *International Clinics* (Vol. iv, Series 26, 1916; J. B. Lippincott Company, Philadelphia and London) leaves the impression that some at any rate of the latter's eight patients may have been suffering from venereal granuloma, a diagnosis apparently not considered by Dr. Tucker. The disease is not unknown in the United States of America; in 1913 Grindon (*Journ. Cutan. Diseases*, New York, 1913, xxxi, 236) described three cases of it met with at St. Louis.

PATHOLOGY.

PROFESSOR MACCALLUM'S *Textbook of Pathology*[2] is constructed on new lines. After a series of preliminary chapters on disturbances in the circulation, and in metabolism, and on the defences of the body against injuries of all kinds, there follows a long series of chapters on types of injury as illustrated by various lesions in the organs and tissues of the body. No attempt is made to deal with the lesions of the various organs seriatim, and the result in a textbook may be a little confusing for the student. On reading the book, the plan adopted appears far more suited to a series of lectures. Moreover, the author is compelled to make use of numerous paragraphs in small print in order to drag in lesions which really have no connexion with the type of injury he is writing about. This is illustrated in the chapters on obstruction. In dealing with inflammation Professor MacCallum seems to take too narrow a view of the processes involved. He rigidly separates the phenomena of repair from those of inflammation, and regards the latter as essentially a vascular response. He makes practically no mention of inflammation of non-vascular areas. In dealing with infarction the experiments of Greenfield are not referred to; in fact, in many sections of the book the achievements of British workers are ignored, and the vast majority of the references to the literature given after the various sections are to German authors. To a large proportion of English students, at all events, these references would be useless.

The manner in which the various lesions are discussed is somewhat uneven. Some rather uncommon ones are given prominence, and to others of everyday occurrence are allotted a few lines only. Thus uraemia is dismissed in eight lines and ochronosis receives eleven lines. The author's plan of presenting his subject leads him to a rather irritating repetition of phrases, such as "There is nothing specially characteristic, or nothing peculiar, about the inflammatory process in . . .," etc. When applied to ulcerations in the stomach the statement becomes untrue, especially as the author himself describes quite well the characteristics of a gastric ulcer. The chapters on tumours on the whole are good, with the exception of the section on giant-celled sarcomata, which is quite inadequate. The typical myeloma of the long bones deserves much fuller treatment. The book is beautifully got up and admirably illustrated with 575 figures, chiefly from drawings. Of the coloured figures, Fig. 234, of old scars in the heart wall, and Fig. 323, of caseous pneumonia, are especially good.

Although we have been compelled to draw attention to several respects in which its construction seems to be faulty as a textbook, the volume is one which may be read with advantage by teachers.

[2] *A Textbook of Pathology.* By W. G. MacCallum. Illustrated chiefly by drawings by A. Feinberg. Philadelphia and London: W. B. Saunders Co. 1916. (Sup. roy. 8vo, pp. 2000; 575 figures. 35s. net.)

NOTES ON BOOKS.

THE book by Carrel and Dehelly on the treatment of infected wounds, reviewed on February 24th, has been supplemented by a brief and practical booklet prepared by J. DUMAS and ANNE CARREL[3] for the use of nurses. Full details of the technique of applying these dressings are given; the apparatus used for the continuous irrigation is described and figured, together with the exact mode in which it is applied. Several pages are given to the details of the preparation of Dakin's solution, and several pages are devoted also to the method of ascertaining the results of the treatment by study of the number of microbes visible in stained microscope slides prepared from the secretions of the wounds under treatment.

The fifty-third edition of HERBERT FRY'S *Royal Guide to the London Charities*[4] gives a business-like account of the metropolitan charities of all sorts that have done such excellent work for years and years in the relief and prevention of distress. In the preface to the volume the editor notes that in 1916 the sum of £1,800,000 was bequeathed in the cause of charity, and draws attention to the great importance of lessening our unduly great infant mortality. The book should be consulted by all who have money to give in charity and do not know where best to bestow it.

[3] *Pratique de l'irrigation des plaies dans la méthode du Dr. Carrel.* Par J. Dumas et A. Carrel. Paris: A. Maloine et Fils. 1917. (Cr. 8vo, pp. 28; 5 plates. Fr. 1.25.)

[4] *Herbert Fry's Royal Guide to the London Charities.* Edited by J. Lane. New and revised edition, the fifty-third. London: Chatto and Windus. 1917. (Cr. 8vo, pp. 353. 1s. 6d. net.)

MEDICINAL AND DIETETIC PREPARATIONS.

Citrated Malted Milk.

HEDLEY'S MALTED MILK (citrated), prepared by the Hedley's Malted Milk Co., 57–59, Ludgate Hill, E.C., is a food consisting of dried milk and malt extract and is stated to be specially digestible owing to the fact that the milk has been both malted and "citrated." Our examination of a sample supplied to us gave the following figures:

Fat	...	19.1 per cent.
Sugars, calculated as maltose	...	54.9 „
Diastatic power, by the method of the *British Pharmaceutical Codex* ...		89.4

The general characters of the sample were those of a mixture consisting principally of dried milk and malt extract, the fat having the refractive index of milk fat, while the principal sugars present were maltose and lactose. The food is very palatable, and, after preparing in the prescribed manner, yields a loose clot when mixed with 0.2 per cent. hydrochloric acid; it will, no doubt, be excellent for infants and for adults needing an easily digested food.

MEDICAL RESEARCH IN INDIA.

AT a meeting of the Indian Section of the Royal Society of Arts on March 27th, when the Right Hon. AUSTEN CHAMBERLAIN, Secretary of State for India, was in the chair, Sir R. HAVELOCK CHARLES, President of the Medical Board, India Office, and Medical Adviser to the Secretary of State, read a paper prepared by Sir C. Pardey Lukis, Director-General of the Indian Medical Service, on opportunities for original research in medicine in India.

Mr. AUSTEN CHAMBERLAIN, in some introductory remarks, said that Sir Pardey Lukis, in the interval between the resignation of one director of the Army Medical Service in India and the arrival from Europe of his successor, had served in that capacity, and Mr. Chamberlain was glad to have the opportunity—especially in view of the criticism, some of it just and much of it unjust, which had been passed upon Indian medical administration—of publicly paying a tribute to the admirable work done by Sir Pardey Lukis during the few months in which he occupied the position. Mr. Chamberlain also spoke of his indebtedness to Sir Havelock Charles for the work he did at the India Office, where he discharged his often difficult and disagreeable task with great impartiality.

The paper pointed out that, though few were unconscious of the debt the empire owed to medical research, some might not have a clear idea of its magnitude. In the vast British tropical and subtropical dominions, and in the smaller outposts, inhabited by fellow subjects, few of whom had any knowledge of sanitation or preventive medicine, diseases largely of a preventable nature prevailed, and caused death-rates unparalleled in more fortunately placed Britain. It was no exaggeration to say that the science of tropical medicine had practically been created within the last twenty years. Anterior to that date important discoveries were made—Laveran's discovery of the malarial parasite in 1880; Koch's discovery of the cholera vibrio in Egypt and in India in 1884–85; Vandyk Carter's work in Bombay on the spirillum of relapsing fevers; Manson's observations on filaria and mosquitos in 1879–83, and Kitasato's discovery of the plague bacillus in 1894. But workers were few, and it was not until the close of the last century that the importance of the subject began to be realized. The efforts of Sir Patrick Manson to obtain for tropical medicine its due meed of recognition could hardly be rated too high. In 1893 Ronald Ross, then a member of the Indian Medical Service, showed that a species of mosquito acted as host to convey from bird to bird the malaria-like proteosoma parasite, and demonstrated its life-history; subsequently he observed an identically similar cycle in the development of the malaria parasite itself. These observations opened up new and important fields of work and attracted numerous enthusiastic workers, but the late Mr. Joseph Chamberlain was the first to recognize the importance of Britain's overseas dominions and to impress upon stay-at-home persons the necessity for making the dwellers in these vast countries healthy and contented. Through him research in tropical medicine received an impetus, the effects of which were seen to-day. Two schools of tropical medicine were established in England—the one the London School at Albert Dock, which owed so much to the help of Mr. Joseph Chamberlain, and the other at Liverpool.

Sir HAVELOCK CHARLES, in the names of workers in tropical medicine, thanked Mr. Austen Chamberlain for presiding at the meeting that day; all knew the immense burden of work on his shoulders, but, in spite of it, in keeping with the spirit of his father's memory, he, to show his sympathy with those engaged on work for India and the Indians, had made time to be present. This act could not fail to have a good influence, proving that the Secretary of State was not unmindful of the benefits conferred on India by the Western system of medicine and the untiring labours of the medical profession in that country.

India, indeed, had not been slow to appreciate the importance of the movement for the study of tropical medicine, but the terrible visitation of plague involved the country in unparalleled misfortune, and the difficulties, the mistakes, the failures that attended the efforts to control that disease, due to the ignorance of the mode of its spread, demonstrated the urgent need of medical research. The Indian Medical Service, towards the close of the nineteenth century, had been fortunate in attracting a number of men with a special bent for research work. Individual officers fired by enthusiasm carried out investigations, often in the face of considerable difficulty, with little or no official encouragement. Such men were Semple, Glen Liston, Rogers, McCarrison, and Mackie. Their work did much to bring about the formation of a bacteriological department which in recent years had so developed that it now consisted of twenty-nine cadre appointments, not reserved entirely for members of the Indian Medical Service but open to independent medical men possessing the necessary qualifications for medical research, of whom some were already at work. In India there were three research laboratories—at Kasauli, Bombay, and Madras; and five Pasteur institutes—at Kasauli, Coonoor, and Rangoon, one about to be opened at Shillong, and another at Parel, Bombay. Further, two schools of tropical medicine would shortly be opened, one at Calcutta and another in Bombay, while a pathological institute at Madras would form practically a third. All would make provision for post-graduate and research work, and would afford unrivalled opportunities and facilities for the study and investigation of tropical diseases. At Kasauli there was also in connexion with the Central Research Institute the Malaria Bureau, in charge of Major Christophers, doing work of the greatest value. Such remarkable progress effected in a few years was striking evidence of the importance the Government of India attached to medical research. The enthusiasm displayed on all sides augured well for the future, and, provided that India continued to attract medical men with a leaning towards the scientific research sides of their profession, there was no limit to the possibilities of the future.

Perhaps the most important of the more recent developments had been the establishment of the Indian Research Fund Association in 1911; it was generously endowed by Government, and practically the only limit to medical investigation since its establishment had been the difficulty of obtaining a sufficient number of scientific workers of suitable stamp. The articles published in its journal—the *Indian Journal of Medical Research*—showed the subjects which were being dealt with, notably malaria, cholera, dysentery, kala-azar, plague, tuberculosis, diabetes, goitre, leprosy, and various entomological subjects. But though much had been done only the fringe had been touched, and the war had curtailed all work. There was scarcely one of the communicable diseases of India which would not repay further research. With regard to plague, for instance, more accurate information was needed as to the immunity of vast tracts in the east of India and in Burma, as to the part played by grain and grain godowns in the spread of the disease, and as to the influence of late-infected villages in carrying over the disease from one plague season to another. As to kala-azar, information was needed with regard to its mode of transmission, and as to its relation to the infantile form in the Mediterranean. Relapsing fever had been proved to be more common in India than was formerly realized, and investigations were required into the conditions favouring its development and spread. Mackie had shown that it was carried by the body louse, and Nicolle that it was transmitted by the accidental crushing of the louse, but the problem was not simple and the louse was not the only carrier of spirillar fevers in India. The fevers of short duration and uncertain origin, which had many affinities with yellow fever and occurred in many parts of India, called for research as to their occurrence, and also to establish whether they were separate diseases or merely modifications of one and the same. There were still many unsolved problems relating to the dysenteries from the etiological and therapeutic standpoints; much further research with regard to malaria also was necessary, for careful work was needed before the Government of India undertook expensive and extensive measures, such as might be involved in dealing with its endemicity in the Gangetic Delta. There was work also for the botanists, the biologists, the entomologists, the mycologists, and the helminthologists. Among the subjects calling for bacteriological investigations were the various forms of pernicious anaemia, especially the disease called sukhi following childbirth, and beri-beri, to which the military paid a heavy toll. It had, perhaps, a relation to epidemic dropsy, and it and scurvy were of vital

importance to the army. Other problems were connected with the possible fixing of physiological standards of purity for potable waters; as to how far, in view of Greig's recent work, cholera was to be looked upon as a water-borne disease only; as to the possible connexion of goitre with faecal contamination of the water supply; as to the comparative value of the cinchona alkaloids; as to the use of intravenous injections of metallic antimony and soluble antimonial preparations in the treatment of kala-azar; as to the possibility of substituting for emetine the cheaper alkaloids of opium, narcotcine, and papaverine, as remedies for amoebic dysentery, and as to the properties of indigenous drugs. The possibilities of research were limitless, and when its importance was still more widely recognized, as also the debt the medical profession owed to itself, to its country, and to the millions of our fellow-subjects beyond the seas, medical research work in tropical and subtropical climes would attract recruits from the best intellect of the profession. This was the type of worker India required, and for which the Indian Research Fund and the Bacteriological Department of the Medical Service, with their numerous research laboratories and institutes, offered unique opportunities.

Mr. CHAMBERLAIN recalled how his father, when he went to the Colonial Office, quickly came to the conclusion that if this country was to do its duty by its tropical dependencies it was of the first consequence that the health of the people in them should be safeguarded. Nowhere in the empire was there a larger field for research and for fruitful experiment than in India. He was struck at the India Office by the scale on which Indian life was measured; on the one hand the magnitude of the populations, and on the other the immense extent of the scourges—plague, famine, snake-bite—which claimed their victims not by hundreds, but by tens of thousands. For the task of research and alleviation, this country should always send its best to India; nothing but the best would justify the position held and maintained, and never was this more necessary than now. He wished to appeal to the leaders of the medical profession in this country—especially the heads of the great medical schools—to make themselves aware of the openings which service in India afforded, whether in the immediate practice of the profession or in research, and then to spread that knowledge and never to grudge to India some of the best pupils they could produce. As a result of the war there would be a greater call for doctors at home and a more restricted choice of field, but let no one think that all the best must remain here. It was of the first consequence as a matter of imperial policy that the heads of the profession should use their influence to give to India a proportion of their best students.

Sir PATRICK MANSON, who was asked by the Chairman to take part in the discussion, said that in the past he had had considerable experience in the investigation of tropical disease in China, and had been struck by the latent capacity of the Chinese for studies of this description. He believed there was a similar latent capacity in Indians also, and therefore he would strongly urge the encouragement of the natives of India to attempt original investigation in tropical disease. He thought rewards of some sort—he would not say pecuniary—should be offered. He would suggest a multiplication of medical students in the colleges of India, and special attention to be paid to their qualifications. The Indian brain was as subtle as our own, perhaps more so; the imagination of the Indian was as active, and his manipulative skill far greater. He had himself found a Chinaman who, after a little training, was able to relieve him of all the technical work in microscopy. A proper appreciation held out, not only to European medical men in India, but to native medical men as well, would mean an enormous stride in tropical medicine. Sir Patrick concluded with some reminiscences of the interest shown by the late Mr. Joseph Chamberlain in the subject while he was at the Colonial Office.

Sir MALCOLM MORRIS said that his own antecedents were connected with the Indian Civil Service, and as a child he recollected relatives coming home from India to die of liver abscess. This condition was now practically extinct, the result of research in India upon dysenteries. If sufficient encouragement were given, other diseases of the East would fall away one after another. There were at present many thousands of lepers throughout India and China, and no serious attempt had been made until recently to stamp that disease out. Sir Leonard Rogers of Calcutta had, however, started a work in this direction which seemed likely to bear wonderful fruit. While the speaker was visiting India in January, 1914, he saw an Englishman, a member of one of the services, who was afflicted with leprosy. This man came under Sir Leonard Rogers's treatment, and he (Sir Malcolm) had seen him within the last few months, and he was absolutely well; it could not be asserted that the recovery was permanent, but all manifestations of the disease had disappeared. He had seen a similar case in this country, that of a young officer afflicted with leprosy, and the result of carrying out the treatment was much the same as in the other instance.

Major R. MCCARRISON, I.M.S., added his testimony as to the opportunities India afforded to keen officers. The world owed the major part of the present knowledge as to the treatment of dysenteries to India, and even now that serum therapy was recognized as a specific means of cure, the value of salines as an adjunct remained unshaken. Owing to the emetine treatment of dysentery there were practically no traces of amoebic abscess of the liver in the present war.

Sir HAVELOCK CHARLES, in replying to a vote of thanks, said that with regard to the employment of Indians for scientific research, he would like to state that out of twenty-nine appointments in the bacteriological department, six were held by men who were not members of the Indian Medical Service, and of these six, five were natives. The field of India was so large that jealousy was out of the question. The Indian Medical Service had been the father and mother of Indians so far as medical education was concerned, and was a parent ever jealous of his child?

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee on March 13th twenty cases were considered, and £277 4s. voted to seventeen of the applicants. The following is a summary of some of the cases relieved:

Widow, aged 49, of L.R.C.P.Ire. who practised at Great Yarmouth and died in 1915. Was left practically without means, and, owing to ill health, is unable to earn a living. At present staying with friends, who cannot continue to help her permanently. Voted £6 in six instalments.

Widow, aged 29, of M.B.Lond. who was a medical missionary in China and died in June, 1916. Applicant left with two children, aged 2 and 4, and only £35 per annum. Another charity has promised £20 per annum. Applicant wants some help to provide training for herself, so that she will be able to earn a living. Voted £2, and referred to the Guild.

Daughter, aged 50, of M.D.Dubl. who practised at Cambridge and died in 1904. Applicant was a teacher in a boarding school, and in 1913 took over the school, but the venture has not been a success, owing mainly to bad health and bad eyesight, which is gradually getting worse: she has lost the sight of one eye. Is now in great financial difficulty. Voted £10.

Widow, aged 62, of L.R.C.P.Edin. who practised at Wigan and died in 1913. Endeavours to make a living by letting rooms in the summer, but last year was not successful. Only son joined the army, and the allowance of 9s. 3d. a week is all she has to definitely depend upon. There are a few book debts still owing from her husband's practice. Wants help towards her rent. Voted £10.

Wife, aged 38, of M.R.C.S.Eng. who practised at Bournemouth but is now in an asylum. Applicant has no means, and is suffering from advanced tuberculosis. Her three children are provided for at present. She has a little help from other charities, but not sufficient to meet her requirements. Relieved twice, £37 10s. Voted £18 in twelve instalments.

Daughter, aged 56, of M.R.C.S.Eng. who practised at Manchester and died in 1898. Owing to ill health, applicant has had to give up her work as a clerk. Only income a pension from her late employers of 6s. a week. Relieved twice, £26. Voted £15 in twelve instalments.

Daughter, aged 53, of M.R.C.S.Eng. who practised in London, and died in 1895. Although she has tried various kinds of employment, her health will not permit her to continue. At present staying at a home of rest. Relieved five times, £63. Voted £12 in twelve instalments.

Widow, aged 62, of L.R.C.P. who practised at Dumfries and died in 1909. Applicant was left with four children, two of whom are now in the army, and the youngest daughter only earning 23s. a week, and not living at home. Applicant unable to work owing to ill health. Relieved eight times, £80. Voted £12 in twelve instalments.

L.R.C.P.Edin. and L.S.A.Lond., aged 89 (married, his wife 83), who practised at Wandsworth. Owing to age, not able to do much work. Some years ago lost practically all his practice through the removal of a large railway works from which most of his practice came. This, with the coming of the

National Insurance Act, ruined his practice. In great financial difficulties. Relieved once, in 1913, £12. Voted £26 in twelve instalments.

Daughter, aged 50, of M.D.Glasg. who practised at Bawtry and died in 1872. Applicant lives in own house and endeavours to make a living by taking in paying guests, but as she lives on the East Coast has not been successful since the war commenced. Relieved twice, £20. Voted £10 in two instalments.

Widow, aged 53, of M.B.Aberd. who practised at Belfast and Dublin, and died in 1913. Was left unprovided for with four children. The eldest son was in his second year as a medical student when the war broke out, and he joined the army. He has been wounded, and is now invalided out of the service, and is continuing his medical studies. The other children only earning very little. Relieved once, £5. Voted £15 from the War Emergency Fund.

Widow, aged 63, of L.R.C.P.Ire. who practised in London and died in 1916. Her husband was for some years a pensioner of the Fund, and the applicant was left quite unprovided for, and makes a living by letting rooms. Relieved twice, £14. Voted £15 in twelve instalments.

Subscriptions may be sent to the Acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos Street, Cavendish Square, London, W.

The Royal Medical Benevolent Fund Guild is now called upon, as a result of the war, to deal with many widows and children who, in happier times, would not have thought of asking for assistance. It is glad to receive secondhand clothing and household linen. The class of clothes most wanted is that suitable for boys and girls working in offices, for women, and for old men. The gifts should be sent to the secretary of the Guild, 43, Bolsover Street, W.

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE FRIENDLY SOCIETY.

THE thirty-fourth annual general meeting of the Medical Sickness, Annuity, and Life Assurance Friendly Society was held at its offices, 300, High Holborn, W.C., on March 27th, when Dr. F. J. ALLAN, chairman of the Executive Committee, presided.

Chairman's Address.

The CHAIRMAN, in his annual address, said that though the number of new proposals had not been up to the average of pre-war years, which was scarcely to be expected, many members had increased the amounts for which they were insured. While other offices had increased their rates for men going into the army, the society had decided to take the risk and charge no extra premium for either sickness benefit or life insurance for those members of the profession joining the R.A.M.C. That the risk was not a small one could be gathered from the fact that the number of members had increased from 450 in 1915 to 1,500 in 1916, while the claims for sickness benefit had increased from 44 to 83, and the amount paid from £1,776 to £3,204. The committee had, however, deemed it prudent to limit the amount insurable by army medical officers to £6 6s. a week. Though the sick officers would be in receipt of army pay when sick, the committee recognized the fact that after leaving hospital those members had many additional expenses during convalescence, having in many instances to provide for families on incomes very much less than when in civil life. He believed the other members of the society would esteem it a privilege to be able to assist their professional brethren who had given up their practices, and were risking their lives in the service of their country. As an indication of the risks run by medical officers he referred to the number of decorations conferred on them for conspicuous bravery in attending the wounded under fire, and mentioned the loss the society had sustained by the death of one of its trustees, Sir Victor Horsley, while on active service. He also referred to the deaths of Dr. St. Clair Shadwell, and Dr. H. A. Sansom, both of whom took an active part in the work of the society. With so many members of the medical and dental professions serving in the army, the strain upon those left behind had been very great, and it was not surprising that many members had broken down under it. It was, however, gratifying to know that the number of weeks on which sickness benefit was paid was 10 per cent. below the expectation. One member of the society had emphasized his appreciation of the benefit received by making a donation of twenty guineas to Epsom College in the name of the society, and the votes appertaining thereto were to be utilized, at the discretion of the Committee, for the benefit of past and present members or their dependants. This member had had an accident which incapacitated him for 479 weeks—practically he was permanently disabled; he had received £1,117 from the society, and had paid in only £228. It was remarkable that with the special advantages offered by the society to medical men more members of the profession were not insured in it. The society was probably handicapped because it did not employ agents, but the Committee hoped soon to overcome this difficulty. As a proof of the soundness of the society the Committee had been approached by other insurance companies with a view to absorption or amalgamation, but the proposals had not been entertained. A subcommittee had, however, been appointed to consider whether the benefits now offered could not be increased, and the advisability of developing into a registered company working on mutual lines. The financial statement showed an increase of £6,331 in the funds of the society, but in view of the fall in Stock Exchange values since the war, it had been considered advisable to add £6,000 to the investment reserve fund, which now stood at £10,000. It was, however, hoped that at the quinquennial valuation next year circumstances would have changed and values improved. The society had by new money, conversion of Government stock, old war loan, and Exchequer bonds, invested £40,500 in the new war loan, which afforded a desirable investment at a higher rate of interest than had hitherto been available. With the exception of the Secretary, all the regular staff had been called up for military service, and he had no doubt the meeting would accord him their thanks for the manner in which he had been able to keep the work of the society running smoothly.

Dr. BRINDLEY JAMES proposed the reception of the annual report and the audited accounts for the year 1916, which was carried.

On the motion of Dr. VINRACE, seconded by Dr. HARVEY HILLIARD, the report was adopted and the Chairman's address directed to be printed and circulated among members.

In answer to an inquiry from a member, the auditor, Mr. H. HOLTON STURGES, F.C.A., expressed the belief that the low value of stocks would remain for a generation and that the Committee would next year find it advisable to increase the investment reserve fund.

Election of Officers.

Dr. F. J. Allan was re-elected chairman for the ensuing year, and Dr. S. Squire Sprigge, editor of the *Lancet*, was elected a trustee. The other members of the Committee whose names were before the meeting were elected.

On the motion of Dr. BRINDLEY JAMES, seconded by Dr. VINRACE, a hearty vote of thanks was accorded to the Chairman for the able way in which he had conducted the business of the society.

OUR BELGIAN COLLEAGUES AT HOME AND ABROAD.

THE following additional subscriptions to the Fund have been received:

	£	s.	d.
Sale of lady's jewellery (per Dr. Colquhoun, Dunedin, N.Z.)	5	0	0
Dr. W. W. David	2	0	0
"La Tricalcine"	8	19	8
Mr. J. Y. W. MacAlister	5	0	0
Dr. G. D. H. Carpenter (23rd donation—total, £23)	1	0	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund crossed Lloyds Bank, Limited.

Surgical instruments should be sent to the Master of the Society of Apothecaries, Apothecaries' Hall, Blackfriars, E.C.

MR. W. B. MCKINLEY has given £24,000 to the University of Illinois for the establishment of an infirmary for the use of the students and faculties.

British Medical Journal.

SATURDAY, MARCH 31ST, 1917.

MATERNITY, CHILD WELFARE, AND A MINISTRY OF HEALTH.

IT may very well happen that future medical generations will look back to the conference between the President of the Local Government Board and the deputation from the British Medical Association as marking an epoch, although the story goes back to the decisions of the Representative Meeting of 1915, by which the deputation was guided in the opinions it expressed to Lord Rhondda. The conference was primarily concerned with maternity and child welfare, and the cordial agreement of the Association with the desire of the Government to deal effectively with these problems was expressed; but the discussion went further, for Lord Rhondda, in opening the conference, more than hinted his desire to establish one single central health department in order to prevent overlapping, and the spokesman of the Association agreed with this view, but insisted that in any unified central health department or ministry of health the clinical side of the work of the profession should be represented both centrally and locally on an equality with the administrative side. Lord Rhondda himself referred to the suspicion with which the Local Government Board is regarded by general practitioners, and, it may be added, not by them alone. Of the woes of that department, certainly that of being well spoken of by all men is not one. In fact, the Board has very few friends. This may be in part due to its association with our antiquated Poor Law system and to the nature of the control it is required to exercise over local authorities and the manner in which it has been exercised, but not wholly, for in dealing with medical questions there has often been displayed a want of insight and imagination—of what it is the fashion to call "vision." Lord Rhondda, judging from his career, must possess imagination, and his vision is the saving of the lives of fifty thousand infants a year. It is a noble ambition, one which the medical profession has long entertained, and it is to its persistent efforts that the public demand for action is due. There is a risk that any scheme drawn by the Local Government Board may be defective because it has no advisers possessing clinical experience, no organization for dealing with the clinical needs of the people, and, except in its very indirect influence on the treatment of infectious fevers, no concern with the treatment of the sick man or woman or child in the home save in so far as it has to do with Poor Law administration, which, it is to be hoped, will not be taken as a model for the extension contemplated. The methods of administration applicable to the prevention of disease, and particularly of epidemic disease, are not suitable to the bedside treatment of other diseases and to their prevention, and it shows lack of "vision" to suppose that they could be.

The Insurance Act, however we regard it—and at the present moment it does not seem very popular with any one—had at least two conspicuous merits: it recognized that to ostracise the family practitioner would not be to the advantage of the public or to the advancement of medicine, which, after all, are only two aspects of the same matter, and it recognized that medicine cannot be advanced without facilities for research. It is a significant fact that, owing to the demands made by the war, the Medical Research Committee has been occupied almost since its inception in the study of clinical problems—the treatment of dysentery and dysentery carriers, the relative value of antiseptics, and the diagnosis and treatment of so-called functional diseases of the heart, to mention only three of them.

It has to be realized that schemes for the public supervision of the medical treatment of most persons have, as the report of the British Medical Association in 1915 pointed out, already gone very far: there is the period of birth to school age with which the maternity and child welfare schemes are to deal; there is the period of school attendance when the child's health is supervised by the medical department of the Board of Education; and there is the period from 16 years of age onward, when all persons engaged in industrial occupations come within the operations of the Insurance Act. From 16 years onward treatment for all ordinary conditions of ill-health is, in practically all cases, assigned to the general practitioner, and it would be a departure from a desirable continuity of method if a different system were encouraged in the earlier years. Yet there can be no doubt that the scheme of the Board for maternity and child welfare must, unless greatly altered, tend to the formation of a class of practitioners wholly concerned with the treatment of disease in expectant mothers and young children. Sooner or later the effect of such a system would be to withdraw the whole of actual practice among such patients from the general practitioner. The most satisfactory and valuable form in which the family—parents and children—can receive advice and treatment is through the family doctor, with personal choice as to who he should be; the scheme of the Local Government Board, since it tends to lead away from this ideal to a method of treatment by one or two officially appointed whole-time medical officials, must be detrimental to the public and the profession alike. There are no good grounds for creating such specialists, and the sound policy will be to regard the employment of general practitioners as the normal method by which advice and treatment shall be given to expectant mothers and young children. The family practitioner should be the essential element in all schemes for giving attendance to the industrial classes; the same practitioner would then advise the expectant mother, attend her in confinement when necessary, attend the infant and the children, whether for ordinary diseases or for the so-called "school diseases," and continue his attendance after the children have become insured persons, as the vast majority of them will.

As Sir Clifford Allbutt pointed out, the tendency of recent legislation had been to diminish the responsibilities of the family doctor by withdrawing from him the treatment of certain diseases, including infectious diseases, which may be inevitable, but including also tuberculosis, venereal diseases, and what is in the present connexion of special importance, the care of children, which does not mean merely their treatment when they ail. The wise advice of a doctor acquainted with the history of the family and familiar with the conditions of life in the district can do more to preserve child life than any amount of specialized advice given in centres, or the distribution of leaflets in tons. Sir Clifford Allbutt paid a generous tribute to the general practitioners of the country, of whose abilities and efficiency he has had personal knowledge

during many years' experience as a consulting physician, as well as unrivalled means of judging the intellectual quality of the men now going into general practice from his experience as professor of medicine in the University of Cambridge—probably the school in this country which in the present generation has turned out the largest number of general practitioners. It is, as he said, of the highest importance to the community that there should be no deterioration in the quality of medical men entering into this the most important branch of the profession. The family practitioner cannot be replaced by the official without injury to the community. If the diagnosis and treatment of certain diseases are by degrees to be placed to an increasing extent in the hands of special whole-time officers, it must follow that the experience of the private practitioner in these diseases and his interest in them must gradually cease, and his efficiency thereby be lessened.

Lord Rhondda did not give any distinct indication of the scope of the bill he proposes to introduce. Originally it was, we believe, a small measure designed to correct an oversight, and Lord Rhondda laid stress on the fact that the measure he has at present in hand is an enabling bill only, and that it would not preclude any measures which were desired in regard to infant welfare. But the common history of an enabling bill is pretty well known; either it becomes a dead letter, or such pressure is put upon local authorities to adopt it that it is early applied in all great centres and is eventually made compulsory. It is therefore of the first importance that the principles of the enabling bill should be such as would command the support of the profession and commend them to those really acquainted with the needs of the industrial classes. They may be summed up in the statement that the general practitioner should be relied upon for clinical treatment and that the salaried whole-time medical officer should be an organizer and administrator only.

It would be premature for us to attempt to discuss the larger proposals for the establishment of a unified central health department or Ministry of Health. The matter is now being very carefully considered by a special committee of the Association; it calls for the exercise of wise statesmanship, and we are glad to find that Lord Rhondda himself looks at the matter in a broad way, and is convinced that the general or family practitioner must be encouraged and helped, and his services used to the full. We wish him every success in the enterprise on which he has embarked, but every one will realize that it is no easy task. It would seem that in such a ministry as he contemplates would have to be included the public health and a large part of the Poor Law work of the Local Government Board, the medical, sanatorium, and maternity benefits, and the research department of the Insurance Commission in England and Wales at least, and the medical department of the Board of Education; this would leave out the factory department of the Home Office and the Board of Control (Lunatics and Defectives), to mention only two other highly organized departments of the State.

The profession will recognize that the proposal now to be made, and the extensions which may be expected to flow from it, may go a long way towards acceptance by the State of responsibility for the treatment of all dependents of insured persons. The profession is familiar with the idea that such a proposal might be made, although it was not generally anticipated that it would be put forward during the continuance of the war.

MEDICAL RESEARCH IN INDIA.

THE meeting of the Indian Section of the Royal Society of Arts on March 27th, to hear a paper by the Director-General of the Indian Medical Service on opportunities for original research in medicine in India, was distinguished by the presence of the Secretary of State for India, who, by presiding on this occasion, in spite of his great burden of official work, never greater than to-day, showed his own appreciation of the importance of medical research to the good government of India and the welfare of its inhabitants. As Sir Havelock Charles, who read Sir Pardey Lukis's paper, said, all workers in tropical medicine, who already owed so great a debt to the prescience of the late Mr. Joseph Chamberlain, would be stimulated by the knowledge that his son was imbued with the same spirit and recognized the benefits conferred on India by the Western system of medicine and the untiring labours of the medical profession in that country.

The occasion was remarkable also by reason of the grounds upon which the appeal was made. It was founded not on the offer of material rewards, but on a belief in the readiness of medical scientific workers to respond to the call to undertake medical research in tropical and subtropical climes. The inducement was the extraordinary opportunities afforded for useful work; they were enumerated in the paper and we need not repeat them. That facilities for such work exist in India is due largely to the Indian Research Fund Association, founded in 1911 with financial support from the Government of India. Practically, it was said, the only limit to medical investigation since the establishment of this association had been the difficulty of obtaining a sufficient number of scientific workers of a suitable stamp. The first move of recent years was the creation of a bacteriological department and the foundation of research laboratories in Bombay, Kasauli, and Madras. This department is not staffed entirely from members of the Indian Medical Service. Of the twenty-nine appointments in it six are at the present time held by independent practitioners—one European and five Indians. The wisdom of this policy was commended by Sir Patrick Manson, who considered that if encouragement were given to natives of India to attempt original research in tropical disease they would prove efficient investigators. As Sir Havelock Charles said in concluding the discussion, the field in India is so large that there ought to be no room for jealousy. We also believe that he and Sir Pardey Lukis are right in maintaining that selection for these appointments must be severe, and that such national prejudices as exist must be set aside. Only men of high intellectual capacity can do work of the kind that is wanted; they must be thoroughly trained and preferably not in one school, they must be chosen on the promise they give during their period of training, and must have the stimulus of knowing that continuous energy and enthusiasm will be rewarded. About the magnitude of the field there can be no sort of doubt, and that the laboratory facilities provided for research are already considerable is shown by the fact that in addition to the three research laboratories already mentioned there are Pasteur institutes at Kasauli, Coonoor, and Rangoon, and that two others are about to be opened, one at Shillong and the other in connexion with the Bombay Bacteriological Laboratory at Parel. Kasauli is a kind of centre, for it is there that is established the Central Research Institute, with a special malaria bureau, to deal with the endless questions,

administrative and therapeutic, relating to the treatment of venereal diseases.

Though at the present time the energy of research workers in India, as in other parts of the empire, is turned to problems connected with the war, the Government of India does well to look forward, and to seek to enlist young medical men with scientific leanings. In order that men of the necessary intellectual capacity and attainments may be attracted, it will be essential to have a well thought out scheme ready to put into force, and it must be realized that one of the conditions of success will be the provision of adequate funds. There are many problems calling for the undivided attention of individual workers, and it may be said that the research institutes and laboratories mentioned afford them opportunities; but there are others which require what is called "team work," that is to say, an organized attack upon a problem by a sufficiently numerous body of workers led by a man who has proved his capacity in research and provided with adequate funds for carrying the inquiry to a successful conclusion. As an instance, we may take those fevers of short duration to which Sir Pardey Lukis referred as in some respects showing striking affinities with yellow fever, and those others which are either dengue or diseases nearly resembling it. Such problems can only be solved by extensive simultaneous epidemiological investigations in various districts, backed up by laboratory research.

It must also be realized that to receive the benefit which the methods of modern Western medicine can confer there will need to be established a deliberate policy to be pursued by the Government of India for a term of years and for which the cordial co-operation of the financial department must be assured. The services which well-directed medical research can render must be seen from a proper point of view and in proper focus by that department, which, we fear, is prone to look upon expenditure on medical research as unremunerative. There could not be a more fundamental error. The duty of the Government of India is to bring happiness and prosperity to the peoples of that great country; but, even looked at only from the commercial point of view, the discovery of the cause of a widespread endemic or epidemic disease, leading as it does to effective methods of prevention, is worth untold millions to the industry of the country, and would very soon be reflected in the budget. Experience shows that competent men will be attracted if opportunities for useful work are assured to them, but we should strongly deprecate any attempt to trade upon the altruism of the profession. The labourer is worthy of his hire, and must be made to feel from the beginning of his service with the Government of India that good work will be honoured and rewarded.

WORKING OF VENEREAL SCHEMES.

THE Local Government Board has presented to Parliament a statement showing the progress that has been made in the organization of measures for the provision of free diagnosis and treatment for persons suffering from venereal disease. The Board has information that between 130 and 140 hospitals in England and Wales have expressed their willingness to participate in the schemes of local authorities, and although in a few instances the authorities of important hospitals have been reluctant to inaugurate during the war any fresh arrangements for the treatment of these diseases, this hesitation has already been overcome in some cases. The shortage of medical staff and the pressure on the accommodation at most hospitals at the present time have presented obstacles in many instances, but the former difficulty has been met to some extent by the Army Council arranging that certain officers of the R.A.M.C., who are specially skilled in the treatment of venereal diseases, should devote part of their time to the work of the clinics provided at general hospitals for the treatment of these diseases. Schemes for the diagnosis and treatment of these diseases have now been submitted to the Local Government Board by 86 out of the 145 councils which are charged with the execution of the regulations. The total population of the areas of these councils is 23,500,000. Forty-five schemes, serving a population of over 16,000,000, have been approved and the work has already started at 30 hospitals. It is estimated that the facilities provided at these hospitals will serve a population of at least 12,000,000. A comprehensive scheme for London and the Home Counties, embracing 22 of the hospitals in London, was inaugurated on January 1st last. The councils at present participating in the scheme include the county councils of London, Buckinghamshire, Essex, Hertfordshire, Kent, Middlesex, and Surrey, and the county borough councils of Croydon, East Ham, and West Ham. The Middlesex County Council has also arranged for the provision of special facilities at the Prince of Wales's Hospital, Tottenham; the Essex County Council has provided similar facilities at the Chelmsford and Colchester hospitals, and is arranging for a special clinic at the Saffron Walden Hospital, and the Kent County Council is negotiating for the provision of special facilities at the hospitals at Dover, Folkestone, Gravesend, Rochester, and Tunbridge Wells. A scheme of diagnosis and treatment for the whole of the counties of Durham and Northumberland is already in partial operation. The councils participating in this scheme include, in addition to the two county councils, the county borough councils of Darlington, Gateshead, Newcastle-on-Tyne, South Shields, Sunderland, Tynemouth, and West Hartlepool. The whole of the pathological work for this large area will be performed at the Durham University College of Medicine, and treatment centres for venereal diseases have been opened at the Royal Victoria Infirmary, Newcastle-on-Tyne, and the Sunderland Royal Infirmary. Treatment will shortly be commenced also at the Durham County Hospital and the Darlington Hospital, and negotiations are in progress for the establishment of further treatment centres at Gateshead, Hartlepool, and South Shields. The scheme of the Portsmouth Town Council came into operation on February 20th last, and the necessary facilities for pathological diagnosis and for treatment are provided at the Royal Portsmouth, Portsea, and Gosport Hospital. The area conveniently served by this institution includes, in addition to Portsmouth, parts of the counties of Hampshire and West Sussex, and the Isle of Wight. The Leicester Royal Infirmary, which serves Leicester and Leicestershire, started operations on March 2nd, and provides the necessary laboratory facilities. Treatment centres are to be opened on April 1st at the Norfolk and Norwich Hospital for the county of Norfolk, part of the county of East Suffolk, and the county boroughs of Norwich and Great Yarmouth, and at the Hereford Hospital, which will probably be utilized by patients from other counties besides Herefordshire. The Birmingham Corporation has arranged for the provision of a treatment centre at the Birmingham General Hospital, which will serve a wide area round the city, Sheffield, part of the West Riding of Yorkshire, and probably other areas will be served by the Sheffield Royal Hospital, the Sheffield Royal Infirmary, and the Jessop Hospital for Women, and the Leeds Corporation is arranging for the necessary facilities to be provided at the Leeds Royal Infirmary. This institution will also conveniently serve part of the West Riding and possibly some other areas.

TSUTSUGAMUSHI DISEASE.

TSUTSUGAMUSHI or kedani disease is an acute infectious exanthem at present known to occur only in the northern coastal districts of Japan. It has a high mortality, varying year by year between 20 and 50 per cent. The infection takes place by the bite of a mite similar to the European harvest-mite, *Leptus autumnalis*, with which many of us are so painfully familiar in the summer. The incubation time of the disease is said to be from five to twelve days, and the disease itself closely resembles Rocky Mountain spotted fever. The characteristic eruption of kedani disease takes the form of small haemorrhages appearing on the face at the end of the first week, spreading thence to the trunk and sometimes the extremities, and lasting for a few days. The average duration of the fever is said to be three weeks. Its specific organism has not yet been recognized with certainty, although in the year 1915 four Japanese observers expressed the opinion that certain piroplasma-like forms found in the spleen, lymphatic glands, and blood, but not in the red corpuscles, might be the cause. The same observers have recently[1] published an account of the mite that is the carrier of tsutsugamushi disease, and they claim a new genus for it, and that the name *Trombidium akamushi* given to it in 1910 should be replaced by the new name *Leptotrombidium akamushi*. In Japan this mite is known by at least four names — tsutsugamushi (disease mite), akamushi (red mite), kedani (hairy mite), and shimamushi (island mite). In the publication now under consideration the authors say that they have found a number of species of *Trombidium* in the Yamagata district in which the disease is endemic, and that they have been able to isolate at least five of these with certainty. In addition they have found the real parent of the tsutsugamushi, and the bulk of their paper is concerned with its nymph and prosopon, which have hitherto been unknown. The mites themselves are carried by field mice; the development of the larvae into nymphs is described in detail, and so is the morphology of the nymph itself. It was not found difficult to breed these nymphs, and careful search revealed the fact that they too could be found in the endemic area. Careful measurements and descriptions of the mature form or prosopon of the tsutsugamushi are also given, and it was found possible to cultivate larvae from these. It still remains doubtful, however, whether these larvae develop from eggs or leave the viviparous parent already formed. At any rate, it has been established that the adult female tsutsugamushi does not deposit eggs in heaps, as is the custom with other *Trombidia*, and that the larvae hatch out all through the year and feed on mammals. Points in the determination of the prosopon, nymph, and larva of *Leptotrombidium akamushi*, *N. sp.* are given in tabular form to facilitate the discrimination from *Leptus autumnalis*, *L. irritans*, *L. americanus*, and other mites of the allied harvester and chigoe breed. No doubt it is the danger of infection with the serious tsutsugamushi disease to which investigators of this mite are inevitably exposed while working in infected regions that has for so long discouraged naturalists from determining its life-history. The authors of the paper here briefly reviewed are to be congratulated upon the success with which they have tackled a dangerous piece of work.

[1] M. Nagayo, Y. Miyagawa, T. Mitamura, and A. Imamura, *Journ. Experim. Medicine*, Baltimore, 1917, xxv, 255.

THE COMPULSORY SEGREGATION OF TUBERCULOUS PERSONS.

THE London Insurance Committee, having accepted the report of the Special Subcommittee appointed to consider and report upon the correspondence with the Insurance Commissioners on the subject of funds available for the purposes of Sanatorium Benefit, have passed that report on to the Local Government Board, the Chairman of the Joint Committee, and the Insurance Commissioners. As already reported (SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL, February 17th and March 3rd) this proceeding was carried out by a majority of the lay members of the Committee in the face of the fact that it was opposed by 90 per cent. of the medical members present. The importance of the questions involved have induced the dissentient minority to set forth their arguments for reconsideration in separate form, for the enlightenment of the responsible bodies concerned. Their memorandum contains many points of importance, indicative of the lines upon which the compiler of the report, Mrs. Handel Booth, the Chairman of the Subcommittee, has run into error, for lack of adequate medical guidance. Chief among these is the sweeping recommendation that powers should be obtained to "carry out the isolation of patients proved to be suffering from tuberculosis." A comparison is made between tuberculosis and small-pox and other infectious diseases, and it is assumed that as isolation and segregation have succeeded in stamping out small-pox, so it has only to be applied in order to obtain a like result in the case of tuberculosis. Such an assumption could never for a moment be accepted by any one with practical knowledge of the disease. But apart from the manifest impossibility of carrying out any such plan it is in the highest degree undesirable that the notion of the infectivity of tuberculosis should be exaggerated or even misstated. Already there is a widespread belief that the disease is infectious, and it has been reported by tuberculosis officers and others that, as a result, concealment is frequent. How much more frequent this would become if it were supposed that compulsory isolation must follow its detection, can well be imagined. Tuberculosis is a malady which cannot be dealt with effectually by rough and ready methods. It requires very careful handling, and any influence that might militate against early detection and treatment is to be deprecated. It was impossible for the medical members to allow the proposals contained in the report to pass without protest. Segregation in certain cases is highly desirable, but if carried to its logical conclusion, the recommendation would involve the isolation of all the 150,000 persons who are stated in the report to be disabled annually in England alone, by tuberculous disease. In addition to this it is recommended that patients already under treatment in hospitals and sanatoriums should be detained there if so ordered by the doctor in charge. The hospital is to become the gaol, and the doctor the gaoler. Apart from these impossible conclusions, the report would appear to teem with confusion as to the true meaning of sanatorium benefit, and the idea is allowed to prevail that sanatorium benefit means treatment in a sanatorium for every one who applies for it. Actual residence in such an institution is by no means necessary for many of such applicants, and segregation is not needed. Many patients "suffering from tuberculosis" are not in any way dangerous to their fellows, and dispensary treatment, associated with domiciliary advice, supplies all that is needed to help the patient to keep the progress of his disease in check, without any personal restraint. It is to be hoped that wiser counsels will prevail when the report is considered by the bodies to whom it has been sent, and that amendments will be made in accordance with the representations that have been set forth by the medical members of the committee.

WARM BEDS IN OPEN AIR.

ONE of the chief difficulties in the application of open-air treatment in winter has been in connexion with the maintenance of uniform warmth in the bed. The hot-water bottle has hitherto been the only means available, and although its use is almost universal, no system has yet been devised to minimize its obvious shortcomings where a steady and uniform degree of warmth is desired. In a report recently issued by the managers of the Lord Mayor Treloar's

Hospital for Crippled Children at Alton the medical superintendent, Dr. H. J. Gauvain, gives an account of a new method of heating which would seem to deserve the attention of all hospital managers. Details, either of construction or of cost, are not included in the report, but the plan consists in the application of electricity as a means of uniform warmth to the mattress upon which the patient lies. It has already been tried and proved efficient, and a complete ward is to be furnished with such electrically heated mattresses. The system is stated to be "simple, safe, economical and efficient," and the degree of heat can be regulated so as to maintain an even temperature under all conditions. It is claimed that the problem of keeping patients warm in open-air institutions has now been solved, and if it can indeed be shown to be economical, as that term is usually understood, then its introduction should be welcomed wherever electric facilities can be combined with open-air beds. But it would appear from the published balance sheet that expense has not to be quite so rigidly regarded at Alton as at most institutions dependent upon public charity. It may be noted that no less than £4,000 have been expended on fuel, lighting, water, and sewerage. No mention is made as to cost of electric current, which would probably be included under the heading of lighting. Further particulars as to construction, cost of installation and maintenance of the new mattresses would be welcomed by all hospital authorities.

A FORESHADOW OF THE RED CROSS.

A DIM foreshadowing of the Red Cross at the end of the fifteenth century is described in *La Medicina Practica* of Naples in its issue for February 28th. It is there stated that the beginnings of the movement may be traced to the action of the Venetian Republic after the battle of Fornovo on July 6th, 1495, when the army of Charles VIII in its retreat to France narrowly escaped destruction in the passes of the Apennines. In a narrative written in the form of a diary, an eye-witness, Alessandro Benedetti, who served as a surgeon with the Venetian army, says there were many Frenchmen among the wounded, but all were treated by the Venetian doctors at the public expense. Melchior of Treviso, procurator of the army, had those who could not keep up in the march carried to Parma, supplied them with money in the name of the Senate, and provided surgeons at a liberal scale of pay. "The good jovial old man," says Benedetti, "now Vice-General of the fleet, went round the beds and exhorted the patients to be of good cheer; among them were wounded Frenchmen." The people of Parma marvelled greatly at the clemency shown by the Venetians towards enemies. This, says Paolo Picca, the writer of the article, which first appeared in the *Rivista Ospedaliera* in 1911, is the first instance of such humanity recorded in history. When in 1581 Alessandro Farnese, Duke of Parma, made terms for the capitulation of Tournay, allowing the garrison to come out with the honours of war and undertaking to take care of such wounded enemies as could not be removed, it is very probable that, remembering the noble example set by the Venetians eighty-six years before, he was moved to give it for the first time a more concrete form by embodying it in a formal treaty. On this action is based the claim put forward for Italy to have initiated a radical reform of the barbarous customs of war, which found its consecration in the Geneva Convention and its practical realization in the foundation of the Red Cross in 1864.

MALARIA IN THE UNITED STATES.

MALARIA is one of the great national health problems of America, and has also an important economic aspect. Dr. John W. Trask, assistant surgeon-general of the United States Public Health Service, who has recently reported on the distribution of malaria, says there is probably no State in the Union in which the disease is not present and in which it is not spread by mosquitos bred locally. In the territory extending from the Gulf of Mexico to a line north of the Ohio River and from the Atlantic seaboard to the eastern part of Kansas, Oklahoma, and Texas, few if any localities are entirely free from malaria. In most of the lowlands it is very prevalent; there is less of it in the mountains and better drained areas. The disease is also endemic in south-eastern New York and parts of Connecticut, Rhode Island, and Massachusetts, and in California in the Sacramento and San Joaquin valleys.

Medical Notes in Parliament.

The Criminal Law Amendment Bill.

IN further consideration of the Criminal Law Amendment Bill on March 22nd the Grand Committee dealt with Clause VII, which proposes to embody in this measure sections of the Indecent Advertisements Act of 1889 with an addition. There was some general discussion on a motion by Mr. Glyn-Jones to postpone consideration of the clause, but after an appeal by Sir George Cave, who said that Lord Rhondda preferred that the matter of advertisements should be taken up in this measure rather than in the Venereal Diseases Bill, Mr. Glyn-Jones's proposal was rejected by 33 votes to 3.

There was also some protest by several members against legislation by reference to other Acts of Parliament. Mr. Burns urged that in matters of elementary criminal law the whole of the laws should be brought together. Mr. Herbert Samuel advised the Committee to concentrate attention on amendments of substance, and expressed the hope that if this was done Sir George Cave might produce a bill codifying all the Criminal Law Amendment Acts. Sir George promised to consider the suggestion.

Advertisements.

The Committee then took up Subsection (*a*) of the Indecent Advertisements Act, which it was proposed to incorporate as follows:

> (*a*) A person who publishes by way of advertisement, or causes to be published, any picture or printed or written matter which is of an indecent or obscene nature, shall be guilty of an offence under Section 3 of that Act, and punishable accordingly.

Upon this Mr. Glyn-Jones proposed to strike out the words "by way of advertisement," but Sir George Cave said the writing of a private letter would constitute "publication"—a letter from one person to another would do this—and as it was not the intention to go further in the clause than to amend the Indecent Advertisements Act, he asked that the amendment should be withdrawn.

Mr. Dillon, opposing the amendment, said that if it were carried all literature would come within the scope of the present measure.

The amendment was withdrawn, and the subsection passed. The Committee then considered further subsections, which were adopted as under:

> (*b*) A person who gives or delivers to any other person any such picture or printed or written matter with intent that the same should be published by way of advertisement, shall be guilty of an offence under Section 4 of the Act [the Indecent Advertisements Act] and punishable accordingly.
>
> (*c*) The maximum penalties under Sections 3 and 4 of that Act shall be one hundred pounds and six months' imprisonment instead of forty shillings and one month's imprisonment respectively, and these sections shall have effect accordingly.

The principal discussion occurred on the proposed new subsection as under:

> (*d*) Any advertisement relating to syphilis, gonorrhœa, nervous debility, or other complaint or infirmity arising from or relating to sexual intercourse; and any advertisement which suggests, directly or indirectly, the use or taking of any appliance, drug, substance or thing, for the purpose of procuring miscarriage or abortion, or which suggests, directly or indirectly, that any premises are or can be used for immoral purposes, shall be deemed to be printed or written matter of an indecent nature within the meaning of Section 3 of this Act.

Following upon this is a new section which lays down that the above provision shall not apply to any advertisement by any local or public authority; nor to any advertisement published in any bona fide medical or pharmaceutical publication or trade list; and that a person publishing an advertisement should not be convicted if he had no reasonable ground for suspecting the character of the advertisement.

Objections were raised to the terms of the definition phrases as to advertisements. Sir Philip Magnus held that the words "an advertisement" were "too wide and too narrow." The

chief controversy, however, ranged round the inclusion of the term "nervous debility." Mr. Rawlinson thought that it would rule out advertisements of remedies for overwork which had nothing to do with sexual diseases, and pointed to the advertisements of two well-known preparations—one of which sometimes had the support of testimonials (with photographs) from eminent persons.

Mr. Burns appealed to the Home Secretary to stand by the clause as a whole. He pointed out that there were a large number of unqualified persons dealing with sexual diseases who might profit more by "misery long drawn out" than by rapid cure. The object of this clause he took to be to drive people into the hands of the doctors. The Committee had to decide whether the doctors should be given a monopoly, with virtual control of the disease, or whether an opening should be left for charlatans who had battened on the diseases of the vicious too long. He thought that the medical profession sometimes went too far in pressing for privileges. But if he had to choose between the medical profession (which he considered the greatest profession in the world) and the men who had taken up pornography for their province, he should of two evils choose the less and decide in favour of the doctors.

Ultimately Mr. Glyn-Jones moved to omit the words "nervous debility." Sir George Cave, however, said he did not like to leave out those words, as this form of advertisement was in common use as a means of concealing announcements. Neither did he think there was any real risk that their inclusion would affect genuine preparations for nervous debility. He urged that in the bill the words were restricted in their meaning by the succeeding words, "arising from or relating to sexual intercourse." The Chairman (Mr. J. W. Wilson) suggested that if the comma between "nervous debility" and "arising from" were omitted, the definition would be clear. Sir George Radford repudiated the notion that lawyers or judges were influenced by commas, and the Chairman's demur that he was "surrounded by commas" in statute books on the tables left Sir George Radford cold. He held to his assertion.

On a division, Mr. Glyn-Jones's amendment was defeated by 20 votes to 13. The words "nervous debility" therefore remain in the bill.

Sir Albert Spicer moved a further amendment to add to the prohibitions advertisements of drugs, etc., to prevent conception, but after a very brief discussion this was withdrawn as outside the scope of the bill.

When the discussion was resumed on March 27th, Mr. Glyn-Jones proposed to substitute a new section whereby it should be an offence to recommend by any public notice or advertisement, or by any written papers or handbills, or by label on preparations (which the amendment specified in detail), or on inclosures, any remedies for any venereal disease. But this prohibition was to be subject to regulations which might be made by the Local Government Board.

In the discussion which ensued Sir George Cave at first expressed the opinion that the amendment would be unfair to the chemists as a body, and would make the clause absurd through overlapping. Mr. Dillon having stated that he had received a request from the Pharmaceutical Society for support for the amendment, Sir George said he was willing to reconsider the matter. Mr. Samuel confessed that he did not know what the chemists wanted, unless it was that it should be made clear that a label on a box, or in a window, was to be regarded as an advertisement. If it were decided that such a notice was an advertisement, the point could be made clear.

Sir William Collins said Mr. Glyn-Jones's amendment seemed to propose that the Local Government Board should take the place of the doctors in deciding what were fitting and appropriate as remedies. He should demur to placing in the hands of the Home Secretary or of the Local Government Board decision which advertisements and which remedies were to be regarded as orthodox and which as heterodox. The Royal Commission did not recommend that the medical profession should be given a monopoly, and he preferred that they should stand on their own merits.

Sir George Cave said that the point raised by the amendment was whether power should be given to the Local Government Board. The whole purpose of this portion of the bill was to prevent public advertisements of these things addressed to ignorant people who did not know better than to believe these advertisements. The exceptions were put forward because the Government wished not to prevent the bona fide inventor or chemist bringing to the notice of persons qualified to judge these things what he had to offer. The exceptions were made in favour of freedom.

Mr. Dillon asked how it was proposed to prevent the public having access to medical journals where the advertisements would command greater confidence than if they were in ordinary journals, and Mr. Chancellor wanted to know how it was proposed to distinguish "bona fide" journals.

Sir George Cave replied that this would be a question of fact such as judges were accustomed to deal with. If the paper was a sham that might be found out. He agreed with Mr. Dillon that there was a risk through access of the public to these journals. But he did not think that the man in the street bought papers of the kind indicated. He thought the alternative of reference to the Local Government Board was a novel and undesirable suggestion. He should like, however, to talk this matter over with his adviser to see whether there was any way to meet the question raised as to medical journals.

Mr. Samuel doubted whether the Home Office would be able to avoid the abuse of the advertisement columns of medical journals. He feared that persons wishing to avoid publicity and wishing to avoid going to the treatment places of the Local Government Board would seek information in free libraries and elsewhere. The discussion had referred to high-class papers, but others might spring up which might lend themselves to publication of these advertisements. He doubted whether it was necessary to make the exemptions suggested; could not valuable remedies be notified by circular to members of the medical profession? He did not know whether there was any real danger that the world might be deprived of useful knowledge by the stoppage of advertisements of the kind under discussion. Possibly the Home Secretary could consult the Medical Council before the report stage of the bill.

After further discussion Sir George Cave asked Mr. Glyn-Jones to withdraw his amendment on the understanding that the valuable suggestions made by members of the Committee would be carefully considered before the report stage of the bill, and Mr. Glyn-Jones agreed to do so.

On the clause as a whole, Sir George Radford said as the Committee was passing a sort of a sketch of what the clause might be, it was not permissible to vote against the clause, but he must reserve his opinion as to the course he would adopt when it reached its final stage. The clause was then passed.

Other Clauses.

Clause VIII was also agreed to. It allows a wife or husband to be called as a witness in certain cases.

Clause IX, which proposed that where a charge of incest was made it should not be necessary to obtain the consent of the Attorney-General or of the Director of Public Prosecutions before arrest, but only after remand, was withdrawn, the prevailing opinion of the Committee being that irreparable injury might be done to innocent persons.

At its sitting on March 18th the Committee reverted to the consideration of Clause I, which had been postponed until the other clauses had been disposed of. It concerned acts of indecency and the plea of consent as a defence, the proposal being to raise the age of consent from thirteen to sixteen years. The clause as submitted in the bill was cumbrous, and Sir George Cave now proposed a new and simple clause as follows:

> It shall be no defence to a charge or indictment for an indecent assault on a young person under the age of sixteen to prove that he or she consented to the act of indecency.

In the original clause the reference as to consent was only to the female sex. The new clause was accepted, and an immediate result was that it lightened the notice paper of a number of proposals, for new clauses put down by private members of the Committee, among others one to protect boys, were withdrawn.

Mr. Chancellor afterwards moved a new clause to make common prostitutes liable to detention under certain penalties. Sir George Cave said he regretted very much that Clause VI (to stiffen the law against loitering in the streets) had been cut out; but that having been done, he thought that the Committee could not go back to this question. Mr. Burns also objected, and the motion was withdrawn.

Considerable discussion took place on a motion by Mr. Dickinson to add a new clause to make it an offence for a person knowing he was suffering from venereal disease in a communicable form to communicate it by any action other than was already provided against in an earlier section which dealt with sexual intercourse. Sir George Cave urged that this was a matter rather to be taken up in public health legislation, and spoke of the difficulty of definitions. He thought that as Mr. Dickinson's amendment was framed a person suffering from disease could hardly live. The division gave 16 for the clause and 16 against. The clause was then rejected by the casting vote of the Chairman.

Infantile Death-rate.—In the House of Commons on March 26th Mr. O'Grady asked Mr. Hayes Fisher whether the simultaneous decline of the infantile death-rate to the lowest on record—namely, 91.0 per 1,000 registered births—and of the number of children vaccinated to the lowest number since vaccination was made compulsory would be inquired into so as to ascertain how far the one explained the other, and, if not, whether he had any other explanation of the cause of the decreasing infantile rate. Mr. Hayes Fisher replied there was no foundation for the suggestion that the decline in the infant death-rate was due to the decline in the number of children who were vaccinated. The lower death-rate was not confined to districts in which vaccination was neglected, and at least one-half of the infants died before the age at which vaccination was usually performed. The decline in the infant death-rate was no doubt due to a number of causes, one of the most important of which was the valuable work now undertaken by local authorities and voluntary agencies for attending to the health of mothers and infants.

Re-examination of Rejected and Discharged Men.—The bill introduced by Mr. Macpherson on March 28th for the re-examination of men who have been excepted from service in the army or discharged, provides that where a disabled man accepted for service in pursuance of notice under the bill was, when he left the service, an officer, he shall be restored to the military rank he held unless the Army Council otherwise directs.

THE WAR.

TREATMENT OF FRACTURES.

OBERSTABSARZT PROFESSOR THÖLE,[1] discussing the treatment of gunshot fractures in the field, referred to the divergence of opinion as to the relative merits of splints, extension, and plaster bandages, and went on to trace the several stages in the treatment of fractures of the limb bones from the moment of the receipt of the injury to their transfer to the home hospital, taking fractures of the femur as a standard of comparison for the rest.

In mobile warfare the wounded soldier was placed on a stretcher and the limbs bound together above and below the fracture, below the knees and at the feet, the unwounded limb acting as a splint. In stationary or trench warfare the stretcher could not be used, and the patient was transported in a canvas sheet slung from a pole. Bearers were instructed in placing the patient in a suitable position. Thus, for head wounds they were taught to use a sitting posture, the head end of the canvas being raised; for fractures of the thigh the foot end of the canvas was raised, the legs being over its edge at the knees. In either case the wounded part was steadied by the hinder bearer, and the limbs were not bound together.

I. *At the Front Dressing Station.*

Here every fracture was immobilized in order to avoid further injury during transport, with consequent increase of the haematoma and increased liability to inflammation. For this purpose an external extension splint, 140 cm. long, provided with a foot-board, was used. The splint was perforated in five places for straps, the uppermost passing round the perineum for counter extension, the others below the iliac crest, around the thigh at the knee, and around the leg respectively. Extension was provided by a spiral spring, 5 cm. long, attached to the foot-board and to a figure-of-eight bandage round the ankle knotted beneath the sole. The boot was not taken off unless the leg or foot were also injured; in that case it was removed by cutting, a loop of bandage fixed to the leg with mastic varnish affording attachment for the spring. Pads were placed between the splint and the limb at the level of the straps. If an extension splint was not to be had, the stretcher itself was made use of. The strap of a knapsack passed round the ankle and through the lowest slot of the stretcher-pole on the side of the injury was carried across and fixed to the opposite pole; counter force was applied by a second strap round the perineum, fixed to the upper end of the pole. The limb was further steadied by a third strap passed in figure-of-eight round the knee and the stretcher-pole. At the dressing station all procedures were based on a definite prearranged scheme; individualization in treatment was in place only at the Feldlazarett, and there only in stationary warfare.

II. *At the Main Dressing Station.*

In stationary or trench warfare the case was passed on without delay to the Feldlazarett, where treatment appropriate to each individual case was decided upon. In mobile warfare the nearest Feldlazarett was not a stationary hospital, and consequently the case could not be retained there for treatment, but was passed on to the reserve or home hospital. In order that the patient might bear this prolonged transport, it was necessary to apply a plaster bandage, provided with a suitable window or bridge, to leg and pelvis. The superiority of this method of immobilization and its influence in localizing inflammation were not doubted; it was therefore adopted as early as possible—that is to say, at this station rather than at the Feldlazarett.

III. *At the Feldlazarett.*

In mobile warfare the aim was to transport the case as soon as possible to the home hospital before the infection of the wound had led to marked inflammation or suppuration. The objection to a delay at the Kriegslazarett was the danger of overcrowding; this might be overcome by transporting to the home hospital all cases which appeared to be permanently disabled, retaining within the field of operations only those which had a prospect of again becoming serviceable. Before applying the plaster bandage the wound was attended to. With bullet wounds of small size this was done at the front dressing station. After disinfection of the surrounding skin with tincture of iodine a gauze pad was placed on the wound, covered with wool and fixed with mastic varnish, which was not applied so near the edges of the wound as to obstruct the discharges. At the Feldlazarett this dressing was left undisturbed, and a window made over it on applying the plaster bandage. With a large aperture of exit the wound was lightly plugged with gauze, loosely covered with wool and a bandage; this dressing was changed at the Feldlazarett. Small grenade and mine wounds were treated at the dressing station in the same way as bullet wounds, but at the Feldlazarett the tracks, being almost certainly infected, were laid open. In superficial wounds of this kind the skin was incised from aperture to aperture, thus converting the track into a trough; if the track ran deeper, longitudinal incisions were made at both apertures sufficiently long to enable the deepest part of the track to be reached from either side. If the fragment had lodged, the canal was traced to its termination. Where the bone was comminuted and the wounds were of large size, the edges of the wound were widely excised, all foreign particles and all loose or almost loose fragments of bone removed, all lacerated tissue cut away, and pockets beneath the skin and between muscles opened out; ample drainage was provided. A fair trial was given to the hypochlorite antiseptic method of Dakin-Carrel, but the method was discarded as giving no better results than that of "physical antisepsis." The plaster bandage was mostly applied in the extended position of the limb and under manual extension. Thöle, however, adopted in preference the semiflexed position, because he believed it to produce a more equal relaxation of the muscles and to facilitate the reduction of the deformity. The bandage was applied under anaesthesia, the patient lying on Dittel's poles supported on trestles. A movable foot-board, with heel-cap and strap for the fore part of the foot, attached to one of the poles, served to fix the foot, while extension was applied by means of a pulley and strap applied immediately below the knee. In supracondylar fractures extension was contraindicated and the knee was placed in a position of full flexion with a small chaff-pad in the popliteal space to tilt the upper end of the lower fragment forwards. When completed the bandage was marked with the date and an indication that it was for transport only.

If the removal of the Feldlazarett or the presence of multiple large wounds precluded the application of a plaster bandage, the patient was transported with the extension splint already applied at the dressing station, provided the transport were of not more than two days' duration. The perineal band could not be borne longer, and the extension splint was replaced by a simple wire splint, modelled to the sole and calf and bent at an angle of 150 degrees at the knee, and carried half-way up the hinder aspect of the thigh; firmly fixed to this was a second splint reaching from the middle of the calf to the angles of the scapulae and modelled to the curves of the leg and back. In this way a double inclined plane was produced, which was further supported beneath the knee by an open metal framework.

In stationary warfare the treatment of these cases was undertaken at the Feldlazarett, and if possible treated to the end. This could be done if a Roentgen apparatus were available. Moreover, individualization in treatment was possible here, since the conditions resembled in the main those of a civil hospital. In the earlier stages of treatment it was necessary that large areas of the limb should be fully under observation, so that any local or spreading inflammation might be detected. The plaster bandage did not fulfil this requirement. At the same time, more complete rest was demanded than was afforded by the ordinary weight extension in semiflexion. So long as there was any doubt as to the presence of infection it was desirable that extension should be combined with good fixation by means of a splint. These requirements were met by a splint with a screw extension to the foot-piece, the weight of the trunk then acting as the extending force, while the screw mechanism provided counter extension on the leg and fixed the knee at the apex of the inclined plane. With this splint practically the whole limb could be kept under observation, the transverse bars of the splint being cut

[1] Bruns's *Kriegschir.*, Heft 18, p. 449.

away in cases where the wound was on the hinder aspect of the thigh. If the wound proved to be aseptic the case was then treated as a simple fracture, and the splint replaced by weight extension in semiflexion, the leg being supported in a plaster trough slung by cords from a horizontal pole over the bed. A plaster bandage was used in these cases only when it was necessary to transport them, owing to the lack of a Roentgen apparatus.

If suppuration occurred, but remained localized after eight days, the splint was replaced by a plaster bandage with suitable window or bridge. This was retained to the end of the case if the bones were in good position; otherwise extension was again resorted to after subsidence of the inflammation.

If spreading inflammation occurred, the splint was retained as long as the infection progressed, and even beyond the subsidence of the inflammation when multiple and large wounds were present, since the application of a plaster bandage was then impossible. In these severe cases of prolonged suppuration it was undesirable to use a single form of apparatus for too long a period, and it was Thöle's practice to replace the splint after six to ten days by weight extension in semiflexion with the leg slung up.

On the whole, the author made but subordinate use of the plaster bandage in stationary warfare, since multiple large wounds and spreading inflammation were generally present, and when the inflammation had subsided there was no longer any need for it.

If in stationary warfare the Feldlazarett was suddenly broken up, the cases with plaster bandages or splints were transported without change; those being treated by extension had plaster bandages applied, or, where time was lacking, a splint. The procedure in the case of fracture of other bones is described in similar detail.

CHANGES IN THE GERMAN ARMY MEDICAL SERVICE.

IN the course of a tour of inspection in Germany last summer, Colonel Hans Daae,[1] head of the Norwegian Army Medical Service, was given certain facilities to study German experiences for the benefit of his own service. In Berlin he was shown over the Hauptsanitätsdepot, which has been housed in the gigantic block of buildings owned by Wertheim before the war. Here vast quantities of every requisite for the medical service were stored, classified and indexed. In one department there was an exhibition of models of everything in use at the outbreak of the war, and altered or invented during the war. Colonel Daae was impressed by the smoothness with which everything worked, and he noted, obviously with some envy, that the head of the dépôt and his staff were less overworked than the men holding similar appointments in Norway, Denmark, and Switzerland. The dressings at the dépôt were packed in squares, stamped on both sides, and different colours were employed to distinguish between sterilized and non-sterilized dressings. One of the most radical changes effected during the war concerned instruments and their cases. These were, in fact, discarded, the metal of which they were made being urgently needed for other purposes. To prevent rust, the cloth in which the instruments were kept, in place of the metal cases, was impregnated with paraffin. A sketch of each instrument was stamped on the cloth to show where each instrument should go. The dental equipment provided for the extraction of teeth, for temporary stopping, for fractures, and for the modelling of false teeth and for various refinements in dentistry. The *post-mortem* outfit was also elaborate, and the arrangements for replacing broken lenses for spectacles were good. About 500 application forms for new glasses were received daily at the dépôt.

The manufacture, repair, and control of gas masks also came under the management of this dépôt. Each mask consisted of three parts which were kept in separate tin boxes, packed away in a bag like that for holding the bread ration. The eye-pieces were made of celluloid and secured by rubber rings. In the funnel-shaped respiratory part of the mask was a pumice-like substance impregnated with some chlorine-absorbing preparation. The cloth of the mask was so slack as to allow the eye-pieces to be wiped from the inside by invaginating the cloth with one finger. But in spite of this arrangement, the eye-pieces were constantly getting dimmed by the deposit of moisture. The mask, when put together, was suspended from the neck by a tape whenever the men went into action. To test the fittings of the eye-pieces and rubber rings, air was blown into the mask after soap-water had been poured over the eye-pieces; any escape of air was betrayed by bubbles. The spectroscope was used to detect the nature of the gas used by the enemy.

The original military knapsack was partly replaced during the war by the rücksack, but even this did not give complete satisfaction. All metal lids and fittings were discarded in favour of cloth caps and bands. Every article of copper, brass, and nickel was withdrawn from the medical service and replaced by galvanized iron or papier-maché, with, according to the assertions of the Germans, quite satisfactory results.

It was soon found that the organization of the medical service in the field must be thoroughly revised. Early in the war the infliction of a single casualty was the signal for a medical officer to be sent off to the spot at once; in consequence, the medical service suffered great losses in the first months of the war. A similar mistake was also made in establishing dressing stations before it was even comparatively safe to do so. When the casualties in the medical service had assumed alarming proportions, orders were issued to the effect that the military surgeons should not be sent hither and thither at the command of the non-medical staff, but should themselves determine when and where their services should be given. It had become plain that the military surgeon could balance the risks to the medical service against the good it could do far better than the non-medical divisional commander. Colonel Daae was struck by the improvement effected in the status of the officers in the Army Medical Service during the war. They had become far more independent, and were in every direction more respected than before. He also noted that the heads of the medical service were spoken of with the same regard as the leading generals in the field; the senior officers of the cavalry, artillery, and engineers certainly did not enjoy the same prestige. It would appear that before the war the military surgeon in Germany was regarded as a necessary but inferior official, by no means on the same footing as his fellow-officers in the other services. Now this gulf has been largely bridged, and this process has been hastened by the fact that the old distinction between combatant and non-combatant officer has been much diminished. The combatant officer sits in relative safety by the telephone or desk, while the non-combatant medical officer shares the vicissitudes of the troops in the fighting line.

[1] *Norsk Tidsskrift for Militaermedicin*, vol. i, 1917.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

CAPTAIN W. B. CLARK, R.A.M.C.

Captain William Brown Clark, R.A.M.C., was killed in action on March 13th, aged 37. He was the son of Dr. G. B. Clark, ex-M.P. for Caithness, was educated at King's College Hospital, London, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1903, and graduated M.B., B.S.Lond. in 1905. After filling the post of senior house-physician of King's College Hospital he studied at Frankfort, carrying out researches on the nervous system under Professor Edinger. Subsequently he went into practice at Woking, Surrey. At the beginning of the war he joined the Wounded Allies Relief Committee, went to Belgium in September, 1914, and left Antwerp by the last steamer which got out of that port. He took a temporary commission as lieutenant in the R.A.M.C. on November 4th, 1914, and was promoted to captain on completion of a year's service. He was killed by the bursting of a shell while serving with the Scots Guards. He leaves a widow and a daughter.

LIEUTENANT A. I. MILLER, R.A.M.C.

Lieutenant Archibald Ingram Miller, R.A.M.C., was killed in action on March 11th, aged 34. He was the

second son of Mr. James Miller of Kensington, and late of Ceylon, and was educated at Edinburgh University, where he graduated M.B. and Ch.B. in 1905. He was in practice at Stourport, Worcestershire, until he recently took a temporary commission in the R.A.M.C.

LIEUTENANT T. W. JONES, R.A.M.C.

Lieutenant Thomas William Jones, R.A.M.C., has been reported as recently killed in action, aged 31. He was the son of Mr. J. Trevor Jones, of Rhos, and was educated at Rhos Council School, Ruabon Grammar School, and at Liverpool University. He had a most brilliant career as a student, taking the Gee Entrance Scholarship, the junior and senior Lyon-Jones Scholarships, the University Scholarship in Medicine, and the Holt medal and midwifery prize, and graduated as M.B. and Ch.B. with first class honours in 1908. After graduating he held the Ethel Boyce Fellowship in 1908–9, and employed himself on research work for a year, taking the M.D.Liverpool in 1909, also the D.P.H. in 1911. He subsequently filled the posts successively of house-surgeon of the Northern Hospital, Liverpool, of obstetric assistant at the Maternity Hospital, Liverpool, and demonstrator in obstetrics at the University, and of assistant medical officer of the City Hospital, North Liverpool. In December, 1912, he was appointed medical officer of health to the Borough and Rural District of Wrexham, school medical officer, and medical superintendent of the Joint Fever Hospital, Wrexham. He volunteered for service at the beginning of the war, but could not obtain the consent of the Local Government Board to his leaving his duties at home until 1916, when he took a temporary commission as lieutenant in the R.A.M.C., and went to France last December, and in February became attached to the Northumberland Fusiliers, and whilst with them he was killed. He met his death in the most gallant manner, whilst rendering assistance to a wounded man who was unable to reach cover from shell fire. Dr. S. Edwards Jones, Chairman of the Borough Health Committee, states that during his term of office at Wrexham he did invaluable work in sanitation, and his death has terminated what undoubtedly would have been a brilliant career in the public health service of the country. As a public official he enjoyed the fullest confidence of all his colleagues, and with a remarkable combination of ability and tact he discharged his duties with a thoroughness and efficiency which commanded the admiration of all who were associated with him. Deepest sympathy is felt for his widow and little girl.

Died of Wounds.

LIEUTENANT-COLONEL M. L. WILLIAMS.

Lieutenant-Colonel M. L. Williams, A.A.M.C., whose death from wounds in France on March 3rd at the age of 31 we announced last week, was one of the best known and most promising of the younger men of the medical profession in Victoria. After matriculation he entered Trinity College, Melbourne University, and took a leading part amongst his fellows at the college and in the university. He gained his football blue, and represented Melbourne University in inter-university matches and in first grade football. After a brilliant career as a student he graduated M.B., B.S. in 1908, and took a leading position in the final honours list of his year, qualifying for appointment to the resident staff of the Melbourne Hospital in 1909. He was later appointed medical superintendent to the Bendigo Hospital, and relinquished this appointment to commence private practice in Bendigo. He volunteered for active service, and was appointed as major to an Australian field ambulance which served in Egypt and France. He was later promoted lieutenant-colonel and placed in command of another field ambulance, with which he was on duty when he received the wounds of which he died. His death will be deeply felt by a very large circle of friends, and the medical profession in Australia has lost a most promising member. He leaves a widow and two children.

LIEUTENANT J. M. HAMMOND, D.S.O., R.A.M.C.

Lieutenant John Maximilian Hammond, D.S.O., R.A.M.C., died of wounds received in Salonica on March 15th, aged 41. He was the son of the late Mr. Henry A. Hammond of Bournemouth, was educated at University College, Bristol, and at St. Bartholomew's Hospital, and graduated M.B. and B.S.Lond. in 1908, also taking the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1909. After acting as assistant house-surgeon at St. George's Hospital and as house-surgeon and house-physician at the West London Hospital he went into practice at Bournemouth. In the autumn of 1914 he went with a batch of volunteer helpers from Bournemouth to the English section of the French Military Hospital at St. Malo. His work there for seven months was highly appreciated. In July, 1916, he accepted a commission in the R.A.M.C.; he was ordered to Salonica, and appointed to the 10th Devons, with which regiment he remained till he was wounded in both legs, by the bursting of a shell in February, during an attack on the Bulgar lines. Dr. Hammond was a man of lofty character, high thinking, and strict integrity, whom to know was to love. His quiet, unostentatious work amongst the suffering poor was a constant source of joy to him, and his kindly services will ever be gratefully remembered. His genial personality and conduct were permeated, through and through, by an intense and deeply-rooted religious fervour and conviction, which at once exerted a profound influence for good upon those with whom he came into contact. He was generous to a fault, and whilst his generosity was frequently imposed upon, never a complaining word escaped his lips; indeed, he was too "big" a man to worry about such apparent trifles. Upon joining the R.A.M.C. he was asked whether he would go to a base hospital or on the field, and his reply was characteristic: "I will do whatever you wish." This was the spirit exemplified to the last, and the medical officer in charge of the clearing station wrote that Dr. Hammond showed the most wonderful pluck and endurance he had ever seen, and added that "a few more like him would be a far better object lesson than all the Padres in the country, with the Bench of Bishops thrown in."

Hammond was a sound clinician—careful, painstaking, and conscientious—a faithful and loyal colleague, who will be sorely missed by friends and patients alike. The widest sympathies are extended to his wife and sister, who remain to mourn their loss.

Died on Service.

LIEUTENANT F. G. HEARD, R.A.M.C.

Lieutenant Francis George Heard, R.A.M.C., died at Bradford on March 15th. He was the only surviving son of the late Lieutenant-Colonel Francis Heard of Lenehagh, county Cork, and of Camira, Tipperary, and was educated at Edinburgh, taking the Scottish triple qualification in 1889. After serving as assistant medical officer of the West Free Dispensary, Edinburgh, and of the Rotunda Hospital, Dublin, he went into practice at Undercliffe, near Bradford, where he was medical officer and public vaccinator of the Eccleshill district of the North Bierley Union. He was also honorary surgeon of the Eccleshill division and of the women's sick nursing division of the St. John Ambulance Brigade. He had only recently taken a temporary commission in the R.A.M.C.

Wounded.

Captain W. B. Purchase, R.A.M.C. (temporary).
Captain F. G. Thatcher, R.A.M.C.

DEATHS OF SONS OF MEDICAL MEN.

Clarkson, John Osborne Price, Second Lieutenant Hussars, only son of the late Lieutenant-Colonel Clarkson, I.M.S.(ret.), of Westbourne, Lee-on-Solent, killed on March 10th. He was educated at Stanmore Park, and at Malvern, passed fifteenth into Sandhurst, got a prize cadetship in July, 1914, and was gazetted to the 13th Hussars on December 16th, 1914.

Cotterill, John Henry, Second Lieutenant Royal Highlanders, the 42nd or Black Watch, youngest son of J. M. Cotterill, F.R.C.S.E., Lieutenant-Colonel, R.A.M.C.(T.F.), of Edinburgh, died of wounds on March 14th.

Irwin, Richard Ninyan, Lieutenant Gloucestershire Regiment, younger son of Dr. Stewart Irwin, of Olverton, Gloucestershire, killed on March 6th, aged 19.

Turner, Edward Percy, Captain R.F.A., killed in action on March 19th, aged 26, was the younger son of Surgeon-General G. R. Turner of Radlett. He was educated at Wellington and Christ's College, Cambridge, and was one of the team selected to represent Cambridge against Oxford in the cross-country contest. At the outbreak of the war he was in Japan, but came home and joined the R.F.A. in March, 1915; he proceeded to the front in the following June. He leaves a widow and a daughter.

NOTES.

THE WAR OFFICE AND THE MINISTRY OF PENSIONS.

THE Secretary of the War Office announces that Colonel Sir Walter Lawrence, Bt., G.C.I.E., C.B., has been appointed by the War Office as liaison officer between the War Office and the Ministry of Pensions in connexion with all matters concerning the treatment and training of discharged and disabled soldiers. One of his most important duties will be to act as a link between the military hospitals and the civil institutions which will be formed by the Ministry of Pensions.

AMERICAN RED CROSS HOSPITAL FOR FRANCE.

Dr. Joseph A. Blake, formerly professor of surgery in Columbia University, New York, has been invited by the French Government to take charge of the hospital founded by the late Dr. Doyen of Paris. It is to be conducted as a war hospital under the American Red Cross. The Robert Walton Goelet Laboratories will be incorporated with it and will be under the direction of Dr. Kenneth Taylor. A jaw hospital will be installed in connexion with the new institution.

HONOURS.

A supplement to the *London Gazette* issued on March 26th contains a further list of honours conferred for gallantry and devotion in the field. The following medical officers are included in the list:

Bar to Military Cross.

Temporary Captain Archibald Stirling Kennedy Anderson, M.B., M.C., R.A.M.C., attached R.N. Field Ambulance.

For conspicuous gallantry and devotion to duty. He rendered most valuable services while in command of a bearer subdivision in assisting to collect wounded from a forward area under very heavy fire (M.C. gazetted August 25th, 1916).

Military Cross.

Temporary Lieutenant Herbert John Davidson, M.B., R.A.M.C., attached R.N. Field Ambulance.

For conspicuous gallantry and devotion to duty. He tended the wounded in a forward area under very heavy fire. He set a splendid example to all ranks.

Captain Robert Andrew Kerr, M.B., R.A.M.C., attached Royal Warwick Regiment.

For conspicuous gallantry and devotion to duty. He succeeded in rescuing his three bearers who were entombed when the aid post was blown in. He constantly visited the most dangerous parts of the line in order to tend the wounded.

Temporary Lieutenant Allan George Reid, R.A.M.C., attached R.N. Field Ambulance.

For conspicuous gallantry and devotion to duty. He tended the wounded under very heavy fire and worked continuously for thirty-six hours in command of a bearer subdivision which was operating in a forward area.

Captain Norman Craig Shierlaw, A.A.M.C., R.M.O., Australian Infantry.

For conspicuous gallantry and devotion to duty. He continually attended to the wounded for two days and nights under very heavy fire. He has on many previous occasions done fine work.

Surgeon John D. Milligan, M.B., R.N., has received permission to wear the decoration of the Croix de Guerre avec Palme conferred upon him by the President of the French Republic for distinguished services rendered during the war. He has also been mentioned in dispatches.

England and Wales.

THE SUPPLY OF MIDWIVES.

THE twelfth annual meeting of the Association for Promoting the Training and Supply of Midwives was held at 9, Queen Anne Street on March 22nd, when Major A. P. Luff, R.A.M.C.(T.), was in the chair.

After the transaction of formal business, Dr. George Reid, County Medical Officer for Staffordshire, gave an address on midwifery and Government subsidies, in the course of which he said that at the time the Midwives Act came into operation there were in Staffordshire 438 bona-fide midwives who notified their intention to practise and only 18 qualified women; now the respective numbers were 191 and 129. Large numbers of the bona-fide midwives had dropped out by reason of incapacity, age, and death, but 82 had dropped out by reason of misconduct. He did not suppose that the conditions were worse in Staffordshire than elsewhere, but the inspection was possibly more thorough. As time went on the depletion of the bona-fide class would be much more rapid; of those remaining in Staffordshire 54 per cent. were over 60 years of age. In that county 52 midwives would be required during the next two years to extend the work where it was not at present done and to replace those who had dropped out; on the same basis the number required for the whole of England and Wales would be 1,900. In any scheme that was introduced care must be taken not to kill voluntary effort, not to relieve the pockets of those who were capable of paying for midwifery themselves, and not to compete with efficient midwives so as to prevent them from earning a livelihood. He thought that the scheme ought to be carried out through the establishment of local nursing associations, which in his experience had proved very efficient. These associations, properly subsidized, could be so arranged as to cover the county. They would receive grants from the County Council (a proportion of which would be recovered from the Government) on a basis to be considered in relation to the amount collected in the area. It would also be necessary to subsidize midwives for areas where the population was not sufficient to constitute an association, and here it would be a good thing to train some local resident who could act in cases in her neighbourhood. For areas still more scattered he suggested a small staff of itinerant midwives, who would live in the homes of the nearest nursing associations, and go as required into the outlying districts. In an area not large enough to maintain a whole-time health visitor the midwife should be trained to act in that capacity. In Staffordshire between 40 and 50 midwives were serving as health visitors. In reply to questions with regard to the advisability of school nursing being undertaken by midwives, Dr. Reid said that, in his opinion, there was no risk in ordinary school nursing with properly trained women. He would not say that the midwife should nurse a case of measles, but there was no danger in dealing with verminous children if the midwife herself was clean.

COMMEMORATION AT MANCHESTER UNIVERSITY.

At the Manchester University, on March 23rd, the commemoration of founders and benefactors was very fitly joined with a memorial service in honour of the graduates and undergraduates of the university who have fallen in the war. The Vice-Chancellor, Sir Henry Miers, presided, and after a short but impressive memorial service the commemorative address was given by the Master of Peterhouse, Sir A. W. Ward, who was formerly Principal of Owens College and Vice-Chancellor of the University. After paying a warm tribute to the men and women of the university who have so freely given their services in connexion with the war, he recalled the fact that the earliest idea of founding a university in Manchester came from Henry Fairfax, who shortly before the Civil War petitioned the Long Parliament for the establishment of a northern university, and specially designated Manchester as the most fitting place, partly because it was the centre of the northern parts and partly because of the foundation of the college already built there—that is, Hugh Oldham's Grammar School. The petition was not, however, granted, as Cromwell founded the University of Durham, for which the sequestered revenues came in very conveniently. In 1783 Dr. Thomas Barnes, with the support of the Literary and Philosophical Society of Manchester, advocated a scheme for establishing a Manchester Academy on university lines. This also came to nothing, and it was not until the foundation of Owens College that any further advance in the direction of a university was made. From the commencement the idea of Owens College foundation was not to allow the instruction given to lean unduly either to the faculty of arts or sciences, and both Owens College and the Manchester University had always been true to the full significance of the university idea.

THE MANCHESTER AND DISTRICT RADIUM INSTITUTE.

A report of the work of the Manchester and District Radium Institute during the year 1916 by Dr. A. Burrows, the radiologist, deals with the first 1,000 cases which presented themselves and practically represents two years' work. It is understood that no cases are accepted for radium treatment unless a surgeon has first declared them to be inoperable; in a number of instances the disease was

much too advanced to hope for any benefit even from radium. The institute has not been open long enough for it to be said that any case has been free for more than twenty-four months. Of the 17 cases reported as apparently free from disease at the end of 1915, 5 have since relapsed, but the other 12 still remain free. The physicist, Mr. Lupton, reports that during the past year 777 ordinary emanation tubes, 338 emanation tubes for needles, and 316 flat emanation applicators were made in the physical laboratory, and a large number of growths and morbid tissues had been examined and reported on at the clinical laboratories of the various hospitals. Sixteen military patients were treated during 1916. Down to December 31st, 1916, the total attendances numbered 2,810, and 589 in-patients had received treatment. The best results appear to have been obtained in cases of rodent ulcer, as out of 101 cases, 46 were said to have been free at the end of the year; two cases which recurred after being reported free at the end of 1915 were brought under control by treatment again. A series of cases of carcinoma and sarcoma are described in detail, and it is noteworthy that over 100 cases of general and skin diseases and chronic inflammations have been treated in addition to the cancer cases. It appears that improvement was effected in 21 out of 40 cases of exophthalmic goitre and in 10 out of 15 cases of keloid, while no improvement was effected in 2 cases of diabetes. Out of 34 cases of benign tumours 18 were improved and 7 not improved. On the other hand, out of 536 cases of carcinoma, 162 were not improved, and 65 died of the disease; 174 are reported improved and 41 were free of the disease at the end of the year. Out of 54 cases of sarcoma treated, 8 were not improved, 11 died of the disease, 18 were improved, and 4 were free from the disease at the end of the year. During the year Mr. Lupton was engaged for part of his time on munition work at the university, and owing to this and the difficulty in constructing a research laboratory, the energies of the institute have been limited to the purely clinical side of its work, but it is hoped that as soon as circumstances permit an increase in the scope of its activities will be possible.

Scotland.

MOTHER AND CHILD WELFARE AND THE HOUSING QUESTION IN DUNDEE.

ON March 20th Dr. J. W. Ballantyne of Edinburgh gave an address in the Town House, Dundee, under the auspices of the Citizens' Committee of the Scottish Council of Public Morals, on mother and child welfare and the housing question. The Primus, Bishop Robberds, presided. Dr. Ballantyne referred to the figures which had been given by Dr. Maxwell Williamson in a paper read before the Scottish Labour Housing Association in January, from which it appeared that in Dundee there were 15,854 people (or 9.9 per cent. of the population) living in one-roomed houses, and 85,324 (or 53.1 per cent.) living in two-roomed houses. In all, therefore, 63 per cent. of the population lived in one-roomed or two-roomed houses. Glasgow had nearly the same (62.5 per cent.), whilst Paisley had actually 64.9 per cent. of her people so situated. He emphasized the effect such housing conditions had upon health, as shown by the infantile mortality, and more particularly the neonatal mortality (deaths in the first month of life); the latter rate he regarded as the most sensitive test of the hygiene of a great city, for in some measure it showed not only the condition of the newborn child but also that of the mother. Dr. Ballantyne also stated that the ethical could not be dissociated from the hygienic aspect of the question, and he counselled a united attack upon a number of wrong things which needed to be righted, referring especially to education as to venereal disease and the elementary facts about reproduction; to prevention in respect of disease in expectant mothers and infants by mother and child welfare schemes; to restriction of the alcohol danger; and to the betterment of the housing conditions, though he expressed the fear that the last-named could hardly be carried out on a large scale till after the war.

Ireland.

RECRUITS FOR THE ROYAL ARMY MEDICAL CORPS.

THE Central Medical War Committee has sent a very urgent appeal to the Irish Medical War Committee to use all its influence to get Irish doctors to volunteer at once for commissions in the Royal Army Medical Corps. The letter stated that the Central Medical War Committee was informed by the War Office that the strength of the R.A.M.C. was much below the establishment which will be necessary for the important movements which are expected during the next month or so. A very large proportion of all the available doctors of military age in England, Scotland, and Wales have been called up. In the circumstances it is hoped that all available Irish doctors of military age will apply at once for commissions in the R.A.M.C., as during no period of the war were their services so urgently required.

ROYAL VICTORIA EYE AND EAR HOSPITAL, DUBLIN.

The report presented to the twentieth annual meeting of the Royal Victoria Eye and Ear Hospital, Dublin, stated that in the intern department 1,571 patients were admitted and that the average number of occupied beds was 92.27. In the out-patient department 7,497 new patients were registered, and 1,876, who had been treated in former years, returned for further treatment; 111 sick and wounded soldiers were admitted during the same period, but though it was satisfactory that these cases could be treated in a hospital specially devoted to affections of the eye and ear, the opinion was expressed that the military did not take sufficient advantage of the hospital. During the year the expenses of the hospital had not advanced proportionately to the advance in prices for food, coal, etc., but the financial position of the hospital was still very unsatisfactory, and under the circumstances the council had to make a special appeal to the public. Several of the medical staff were serving with the colours. Deep regret was expressed at the death of Dr. P. W. Maxwell, who had been connected with the institution since 1897, and the death of Dr. Little and Dr. Fitzgerald.

Canada.

ANTITYPHOID INOCULATION.

THE Department of Militia and Defence have just announced that for the twelve months ending December 31st, 1916, only 167 cases of typhoid fever were reported as having occurred amongst the many thousands of men of the Canadian Expeditionary Force in Canada, notwithstanding the fact that typhoid fever is endemic in all parts of Canada, and is a disease especially affecting young adults from 17 to 30 years of age. This comparative freedom on the part of the Canadian Expeditionary Force is seen to be most striking when it is recalled that during the Boer war one man out of every nine in the British forces in South Africa was invalided through this disease, and that in the Spanish-American war, of 107,000 men in the camps at Tampa, Florida, and elsewhere, who had not left the shores of the United States, 20,000 contracted the disease. The remarkable change can only be attributed to inoculation. The Provincial Board of Health for Ontario has supplied to date all the typhoid and paratyphoid vaccine used by the entire Canadian Expeditionary Force (about 450,000 men). In all, nearly 600,000 doses have been supplied free of cost.

THE PAYMENT OF PENSIONS TO DISABLED SOLDIERS.

Cases of hardship have been reported in which an interval of time has elapsed between the discharge of a man from the Canadian Expeditionary Force and the date of commencement of his pension. It is announced that in future no member of the Expeditionary Force will be discharged until a medical board has certified that no improvement in his condition is to be expected from further treatment or hospital care. He will not then be discharged until a notification has been received from the pension commissioners that the amount of his pension has been

determined and the date upon which the first payment will be made. Thus his pay and allowance will continue until his pension commences. It has also been provided that if a discharged man is found to require further treatment for some disability that has been caused or aggravated by active service, he may, upon the recommendation of the medical board, be reinstated as a member of the Expeditionary Force and again receive his pay and allowance, the pension being discontinued. When the necessary treatment has been given, the man will be re-examined by the medical board and the amount of his pension again determined according to the state of his health at the time of the second examination. In the event of soldiers with dependants being killed in action, dying on active service, or being reported missing, assigned pay and separation allowance will be continued until the amount of pension and date of its commencement have been determined.

FUNCTIONAL TRAINING AND RE-EDUCATION OF SOLDIERS.

The great importance of securing occupation for an injured man is realized by those in charge of the training and re-education of returned soldiers, both during convalescence and after the pension has been allotted. It is essential that he should choose an occupation in which he may become so proficient that he will be able to demand equal wages with the men who are his competitors. In order to assist returned disabled soldiers in their choice of work in which to be trained by the Hospitals Commission, Disabled Soldiers' Training Boards have been established in different parts of the country composed of men who understand the trend of the labour market and the present conditions of labour in their own locality; they will give advice to soldiers desirous of settling in that locality and direct the instruction and training of such men. Other things being equal, Government employment will be given to disabled soldiers or to their dependants; and soldiers who have completed a course of vocational training to the satisfaction of their instructors will be provided with certificates of capacity, so that employers need have no hesitation in giving positions to such men. In giving such certificates a high standard of efficiency will be maintained. The danger of placing returned soldiers in a separate class as regards labour is fully recognized, and everything possible is being done to equip such men so that they will be able to command the same wages as others on the merit of the work they are able to do alone. Were they classed by themselves they might be sure of employment for a few years, but later on the tendency would be to consider them as an inferior class of labour worth inferior pay. A plant for the manufacture of artificial limbs has been established in connexion with the Central Military Hospital in Toronto. Here returned disabled soldiers will be treated, re-educated, trained, and provided with artificial limbs.

Correspondence.

MOBILIZATION OF THE PROFESSION.

SIR,—The resolution passed by the Royal Faculty of Physicians and Surgeons of Glasgow, published in the SUPPLEMENT of March 17th, p. 50, will appeal to most members of the profession.

From what has appeared from time to time in the JOURNAL, compulsion is apparently to be applied to the medical part of the community, but so far no details of the proposed scheme have been published.

There is a strong feeling in many parts of the country that the profession as a whole should be consulted before any legislation is passed, for, judging from recent events, we shall get very little consideration from the party politicians. We have been betrayed by them more than once, and it is hoped those in charge of our interests will demand as a right that the scheme be thoroughly discussed by the Divisions before it takes definite shape and is passed into law.

A little more light upon the subject in the JOURNAL would be grateful.—We are, etc.,

GEORGE ALEXANDER,
A. E. THOMPSON,
Honorary Secretaries, Furness Division.

Barrow-in-Furness, March 26th.

THE PROPHYLAXIS OF VENEREAL DISEASES.

SIR,—"Prostitution is not at the present time a crime at common law." Nevertheless, such actions as loitering and solicitation are punishable, though these actions are to the trade of prostitution what advertisements are to other trades.

It is commonly said that it is useless to make laws against prostitution "because there have always been prostitutes," or "because prostitution is human nature." Let us grant that many men and women have not yet reached the level of most birds (other than those of the Gallinaceous family), we still have to face the fact that prostitution as understood in cities is different from anything found among lower animals, inasmuch as it implies a trade. In all the discussion on the prevention of venereal diseases this element of trade, so far as I have observed, has not been reckoned. I have heard it said that so long as promiscuous intercourse occurs, it is of no consequence medically whether or not it is practised as a trade; but can it be doubted that if economic advantage were eliminated a diseased woman would be much less likely to solicit?

At present, if a woman is imprisoned for brothel keeping, solicitation, etc., no steps are taken to ascertain whether or not she is able to earn her own living by means other than prostitution. I recall the case of a woman imprisoned for brothel keeping who had her child removed from her care, and was required after her term of imprisonment to pay a weekly sum for its support. So far as the law was concerned no steps were taken to ascertain how she was to earn the money. Such a penalty can only urge a woman to pursue the trade of prostitution with greater assiduity. In proportion as a woman depends on prostitution for her livelihood she is unfitted to earn her living by any other means, and to punish her can therefore only make her careful to avoid the policeman; it cannot induce her to relinquish prostitution. There is reason to think that hitherto the community has not in its heart wanted the trade abandoned. There has been a belief that "the prostitute is the guardian of the home." Perhaps we have, even now, not passed "Seraglio Point." To those who have, this belief seems an amazing superstition. Once free of this idea, would it not be possible when the law lays its hand on "an unfortunate" to give up all thought of punishment, and, recognizing that she is "unable to manage herself and her affairs," commit her to supervision under the Act for the Care of the Feeble-minded? Let her be trained to earn her living, or, if she is not capable of this, let her remain permanently under supervision, either home or institutional treatment being provided as may best meet the needs of the individual case, keeping in mind that the object of treatment shall be habilitation, or, if this is not possible, protection and supervision.

Without making any law against prostitution in the sense of promiscuous intercourse, is it not possible that the trade of prostitution shall no longer be regarded as lawful—at least, for those under 21 years?

Parents and teachers recognize, and therefore the law also should recognize, that the girl who physically grows rapidly and matures early is the more immature mentally; she who being 14 to 18 years looks 18 to 21 years is one who is faced with the temptations of an adult while she has still only the judgement and self-control of a child. These are they who really need protection from themselves until they are fully grown in mind. Some remain permanently immature in mind.—I am, etc.,

Cardiff, March 18th. ERIC EVANS.

SIR,—May I once more request space for a few remarks in reference to Sir Bryan Donkin's letter on the above question in your issue of March 24th? I may not have made my point sufficiently clear, but when I wrote "if Sir Bryan Donkin and Mr. Elliot leave alcohol out of their scheme of scientific prophylaxis, they will be disappointed in the results," I referred to alcohol not as an excitant, as Sir Bryan Donkin reminds us it is, of sexual desire, but as a factor capable of seriously diminishing, if not frequently nullifying, the efficacy of the scientific prophylactic procedures advocated by Sir Bryan Donkin.

I asked Sir Bryan Donkin no double-barrelled question, such as he ascribes to me, but if he will refer to his letter of January 27th, he will find that he then said that the subject—the prophylaxis of venereal disease—was one

"which, essentially medical though it is, is of high concern to the whole community," and that "the question is, and should be regarded as exclusively medical."

His letter does not answer my two separate and distinct questions on these points, but I think it contains enough to show that Sir Bryan Donkin is not prepared to adhere to these formerly expressed opinions, and has changed his ground. Dr. Otto May's letter of March 17th is sufficient refutation of Sir Bryan Donkin's statement, in his letter of February 14th, that Dr. May "urged that the question of prevention was a purely medical one," and the closing paragraph of Dr. May's letter must appeal strongly to any man who takes a serious and broad-minded view of the question.

There is, perhaps, no subject of present and urgent national importance in which certain of the dangers of medical specialism and professional exclusiveness of view should be more carefully avoided.—I am, etc.,

Inverness, March 26th. T. C. MACKENZIE.

A CIVIL RESERVE FOR ARMY NEEDS.

SIR,—We have arrived once more at a period when we are told by the military authorities that the need for medical men in the army is acute.

Already the ranks of civilian practitioners have been seriously depleted, and the question of "mobilization of the medical profession" is being discussed, while "compulsion," to say the least, is openly hinted at.

Seeing that the needs of the civil population must always remain a grave consideration, it behoves us to cast about and inquire whether some scheme cannot be worked by which the paramount requirements of the services may be met without prejudicing our patients at home. As a late lieutenant in the R.A.M.C. who spent some nine months serving abroad, and who, therefore, has some knowledge of the life in this section of the forces, may I be permitted to make the following remarks and suggestions?

The work of many medical officers in the R.A.M.C. is far lighter than that of a busy—let alone an average—general practitioner. Often it consists of a few hours a day only.

It is notorious that a commission in the R.A.M.C. is looked upon as a "holiday" as compared with the life of a general practitioner. Now many, if not most, of these medical officers were once general practitioners, and surely could not cavil if their work was temporarily considerably increased. Parenthetically I would add: "Gentlemen will not, others must not, complain if asked to put in something like the same amount of work as was their wont in civil life."

In my own practice I work pretty hard in the daytime, and not infrequently also at night (just recently I was called out of bed five times in four consecutive nights), and if I can do this, why should it not be the lot occasionally of all medical officers in the R.A.M.C.? I maintain that it could not be considered a hardship for them to forego now and again the easy-going routine to which they are so usually accustomed.

Now I take it that a great increase of medical officers will be required on the Western front, and this, be it noted, is separated from us by a few short hours, especially the large base area. Therefore, if a great push comes and the need arises, would it not be possible to transfer a large contingent of medical men from this country to the bases in France within a reasonable time to meet the need? I admit that during those first few hours—it might be twenty-four—the medical officers on the spot would be heavily overworked, but not unduly, in comparison with their civilian colleagues. And surely these medical officers could carry on until relieved by the reserve which would be rapidly sent across from this side. If, then, a reserve could meet the case, is it practicable to have such a reserve ready to hand? I submit that it is.

My suggestion is that doctors who feel that in an emergency their urgent home work could be carried on by colleagues around should hand in their names to the D.M.S. or some other authority and be given a temporary commission without payment. They should, however, be furnished with uniform and limited kit, and must hold themselves ready to proceed at six hours' notice to any seaport or other centre where they would automatically become acting medical officers in the R.A.M.C. Such men should be required to acquaint themselves beforehand—a matter of a few hours' study which any keen man would willingly undertake—with the more important routine obligations and technicalities of the office they will be called upon to fill. They would have previously arranged with their friends in the various neighbourhoods to carry on for them as best they could in their absence, and their sudden call to military duty would be received by the latter with no more concern than other inconvenient but necessary summonses to undertake additional responsibilities. This reserve would form a mobile column available for duty in any locality, but presumably in France, for the reason I have given earlier. There are many medical men in the large towns who could join such a reserve if they felt that their services would only be requisitioned when urgently needed. It might, indeed, be possible, say after some big engagement or series of engagements, when the stress was relieved, to return some, if not all, to their practices at home to be ready again for a further call. By some such scheme the work in England could be carried on with the least disturbance and the large amount of unused time among medical officers obviated.

I am fully aware that my suggestion is unorthodox, and much red tape would have to be cut in order to run it, but surely with keenness on the side of the doctors and intelligent sympathy on the part of the military authorities, some such working arrangement could be evolved for the mutual benefit of the army and of the civil population.—I am, etc.,

March 26th. LATE LIEUT. R.A.M.C.

OLDEST AGE OF PARTURITION.

SIR,—The following may interest some of your readers as well as Dr. Fred. J. Smith, to whom I have sent proof: M. L., born February 13th, 1820, baptized April 9th, 1820, married October 1st, 1840. The foregoing were taken from a local church register, and given to me by the Rev. H. P. Robinson. She had eleven children, the youngest, J. L. S., born April 21st, 1871, still living and a fine healthy man. M. S. died March 25th, 1900. These two dates are verified by the superintendent registrar.—I am etc.,

Gomersal, March 21st. E. R. F. MASON.

Obituary.

ROBERT ROXBURGH, M.B., F.R.C.S.EDIN.,

WESTON-SUPER-MARE.

THE unexpected death of Dr. Robert Roxburgh of Weston-super-Mare on February 16th, in his 64th year, came as a great sorrow to his numerous friends. Educated at the universities of Glasgow and Edinburgh, he graduated M.B.Edin. in 1876, took the diploma of L.R.C.S.Edin. in the same year, and the fellowship four years later. In 1880 he succeeded to the private practice of his brother-in-law, Dr. Gourlay, at Weston-super-Mare, and also became physician to the General Hospital and consulting physician to the Royal West of England Sanatorium, offices which he retained to the time of his death. He was president at various times of the Bristol Medico-Chirurgical Society, and of the Bath and Bristol Branch of the British Medical Association in 1912, and a Justice of the Peace. He had never completely recovered from an attack of pleuro-pneumonia with heart complications in 1902, after which he spent a year in going round the world. On his return he married Miss Fanny Peake, who died four years ago. At the funeral service there was a large and representative gathering.

Dr. THOMAS R. RONALDSON (Edinburgh), under whom he served as clinical clerk at the Edinburgh Royal Infirmary, and with whom a strong friendship existed from 1874, writes: Earnestness and seriousness of purpose in all he undertook were the foundation of a constant reliability. His professional ideals were of the highest. Scientific surgery and medicine had a great attraction for him, but the human element in his patients ever received tender and kindly consideration. His relationships with them and with his fellow workers were of the most cordial character.

Nothing mean or unworthy could live in his presence. The esteem of his fellow students and the respect they had for his professional attainments were evidenced by his election to be senior president of the Royal Medical Society, the oldest of student societies. That his teachers had an equally high opinion of him is shown by the fact that he was chosen by Lord Lister and Sir Patrick Heron Watson to be their house-surgeon in the Royal Edinburgh Infirmary and in Chalmers's Hospital.

After holding these appointments he studied for some time in various German medical schools. Gifted with a happy nature and a keen sense of humour, he recounted well the many amusing reminiscences with which his retentive memory was stored. He had an intense enjoyment of life, of all the best things in it, and no one who ever spent a holiday with him, especially in his beloved western highlands of Scotland as he steered his yacht among its lovely scenery or walked along its picturesque shores, will ever forget his happiness. Yet life had for him, as for all, its shadows and its serious questions, but his pure and strong faith and a deeply religious nature, combined with a wide mental outlook, enabled him to live above all its difficulties, and three weeks before his quiet passing he said, "I am looking forward with intense interest and expectation to the life beyond the grave."

Dr. GEORGE ROSSITER (Weston-super-Mare) writes: If ever any one really loved and enjoyed his profession, both as a science and an art, it was Robert Roxburgh. It was a treat to hear him when he discussed a physiological or pathological problem, and still more when he held forth on the "romance" of the work of his venerated chief, Lord Lister, whom he had served during the early and eventful stages of the battle of antiseptics, or, again, on the triumphs of Patrick Manson, Almroth Wright, and others. He was an accomplished physician, of excellent judgement and rich experience; his wide reading helped to keep him well abreast of the times, and he was constantly called in consultation by his colleagues. His sympathetic kindness, patience, and tact commanded and kept the confidence and affection of his patients, whilst his cheeriness and sense of humour served to brighten their outlook on life. It was quite as much by what he was and did outside his profession that his memory will long be cherished. He had the courage of his opinions, and was fearless in expounding and acting on them; his gift of clear and felicitous expression and uplifting ideas seldom failed to carry conviction and willing co-operation. He was treasurer of the Y.M.C.A., one of the founders of the local Charity Organization Society and the local branch of the Society for the Prevention of Cruelty to Children, the working boys' club, and other kindred institutions. For some years he was vicar's warden at Holy Trinity Church. For more than a quarter of a century president and moving spirit of the Philharmonic Society and local representative of the Royal Colleges of Music, his fine and cultured voice was constantly in request, and only three days before his death from angina pectoris he sang in a duet at a patriotic meeting in the Town Hall in connexion with the war loan, with all the refined execution and verve with which we had been familiar for nearly forty years. His patriotism was both ardent and practical, and at one time he commanded the local detachment of Royal Naval Volunteers.

WE regret to record the death of Dr. WILLIAM MURDOCH of Annan, which took place on March 9th. His health had not been satisfactory for some time, but in spite of this he had been able to undertake a considerable share of work, and three days before the end came he went out to see some patients. It was a bitterly cold day, and in the evening he was seized with severe illness which ran a rapid course. Dr. Murdoch was a native of Elgin, the son of a solicitor in that town, and he spent some years in his father's office, but after his father's death he went to Edinburgh, where he came under the influence of Lister for whom he had the most profound admiration. He graduated M.B. and C.M. in 1877, and M.D. with honours in 1885. He made several voyages as ship surgeon, held two appointments as assistant medical officer in county asylums, practised for a time at Bridge of Allan, but removed to Annan about thirty years ago where he took over the practice of Dr. Rowan and also succeeded him as surgeon to the volunteers attending several training camps and in charge of the field ambulance. As a family doctor he was much respected, being cautious and painstaking, and keeping himself thoroughly conversant with recent advances in medicine. He was for many years medical officer of the Annan District Combination Hospital, and took an active part in the work of the Border Counties Branch of the British Medical Association. He was a member of the Branch Council from 1904 to 1910, was elected President of the Branch in 1909, and was Chairman of the Scottish Division of the Branch in 1907. In his inaugural address on accepting the last-named office he gave a graphic account of his personal experience of sanatorium treatment which he underwent for pulmonary tuberculosis, and which resulted apparently in a complete cure. He retired from the Association as a protest against the policy adopted by it in connexion with the Insurance Act. Dr. Murdoch is survived by his widow, two sons, and a daughter, with whom much sympathy is felt by a large circle of friends and patients. His two sons are serving in France; the elder is a captain in the R.A.M.C.; the younger, who was severely wounded in Gallipoli, now holds a commission in the K.O.S.B.

DR. FINLAY MCDOUGALL of Runcorn died on February 16th in his 83rd year. He was a native of Argyllshire, and received his medical education at Anderson's College and the University of Glasgow. He took the diplomas of L.R.C.P. and L.M.Edin. in 1866, and that of F.R.C.S.Edin. in 1886. For a short time he practised in Staffordshire and then removed to Runcorn, where he practised for nearly half a century. He was appointed medical officer of health for Runcorn and superintendent at the Isolation Hospital, a post which he held for over a quarter of a century, and on his retirement was presented with a silver rose bowl. He became a Justice of the Peace in 1907, and was a regular attendant on the bench. A few years back Dr. McDougall purchased an estate on the banks of Loch Avich in Argyllshire, near his birthplace, where he was able to enjoy his lifelong hobby of fishing. He did not however, sever his connexion with Runcorn, but built for himself a small cottage in Halton Road, Runcorn, where he died.

DR. JAMES CORNS died at Southport on March 20th. He was born in Edinburgh, and received his medical education at the university of his native city, where he was a student under Syme, and graduated M.D. in 1865. After acting for a short time as an assistant at Rochdale he commenced practice for himself in Oldham, and continued to practise there until about eighteen months ago, when failing health compelled him to retire to Southport. He was surgeon to the Oldham Infirmary from 1875 to 1913, when he was elected consulting surgeon, and was also a trustee of the institution from 1904. He was president of the Lancashire and Cheshire Branch of the British Medical Association in 1901–2. Dr. Corns was very fond of travelling, and had visited most European countries.

DR. GEORGE ISLES SWANSON, who died at York on March 16th, was born in Edinburgh in 1840 and was educated at the High School and the University of Edinburgh, where he graduated M.D. in 1861. He left his native city in 1876 to commence practice at Thirsk and subsequently removed to York. He was honorary consulting medical officer to the York Dispensary, a vice-president of the Yorkshire Branch of the British Medical Association and of the York Infant Welfare Association, an ex-president of the York Medical Society, and a member of the Medico-Psychological Association. Dr. Swanson was a staunch Conservative, and from 1881 to 1896 was chairman of the Walmgate Ward Conservative Association.

DR. GIOVANNI ARGENTO, professor of surgical pathology and clinical surgery in the University of Palermo, died recently a few minutes after delivering a vigorous speech at a patriotic ceremony. He was born at Palermo in 1847. He was a careful and successful operator, and has left a number of contributions to surgical literature. He was keenly interested in questions of sanitation and hospital hygiene, and filled many public offices.

The Services.

EXCHANGES.

CAPTAIN in field ambulance in France desires to exchange with an officer in training centre or hospital at home.—Address No. 1050, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Recruiting Medical Officer, Birmingham, desires an immediate exchange with one holding similar appointment in London area.—GALLETLY, Captain R.A.M.C., Curzon Hall, Birmingham.

M.O., Divisional Train, would like to transfer to some unit in a Scottish Division, preferably 15.—Address, No. 1049, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Universities and Colleges.

UNIVERSITY OF ABERDEEN.

AT the graduation ceremony on March 23rd the following degrees were conferred:

M.D.—*J. C. Bell, *G. Riddoch.

M.B., CH.B.—†‡A. G. Lumsden, †G. R. McRobert, W. F. W. Betenson, J. S. B. Forbes, ‡R. R. Garden, ‡A. C. Irvine, W. C. MacKinnon, §C. G. S. Milne, Maggie J. Moir, J. M. Morrison, W. W. Nicol, F. M. Roric, C. Shearer, A. P. Spark, §R. Thom, T. D. Watt, Jean Yule, V. T. B. Yule.

* Honours for Thesis.

† With second class honours.

‡ Passed fourth professional examination with much distinction.

§ Passed fourth professional examination with distinction.

UNIVERSITY OF MANCHESTER.

THE following gentlemen have obtained the Diploma in Public Health: T. C. Mackenzie, S. N. Mitra.

Medical News.

MAJOR H. MACCORMAC, R.A.M.C., will read a paper on April 19th, at 5 p.m., before the Dermatological Section of the Royal Society of Medicine, 1, Wimpole Street, W., on skin diseases under war conditions in France. A discussion will follow.

A BILL allocating £50,000 for the establishment of a national home for lepers passed the United States House of Representatives on May 4th, 1916, and the Senate on January 25th, 1917. It provides a national institution for the care and treatment of lepers, and thus, it is hoped, will prevent the spread of leprosy in the United States.

THE arrangements of lectures at the Royal Institution after Easter include two by Professor C. S. Sherrington, on tetanus: its prevention, symptoms and treatment; and on rhythmic action in muscle and in nerve. Professor D'Arcy W. Thompson will give two lectures on laws of growth and form; and Professor William Bateson two on heredity. Among the Friday discourses (5.30 p.m.) will be one on the organs of hearing in relation to war by Dr. Dundas Grant, another on the complexity of the chemical elements by Professor Soddy, and one on breathlessness by Mr. J. Barcroft.

THE meeting of the Poetry Society on March 23rd, to hear the poems of Sir Ronald Ross, was well attended. Sir Herbert Warren, who was in the chair, paid a tribute to the poetry as instinct with "the passion of the head," and as affording a rare example of high scientific combined with high poetical achievement. The poems, read by the poet assisted by Miss Miriam Lewis and Mr. William Stack of the St. James's Theatre, were representative of the graver side of his work. It was announced that Sir Ronald Ross will shortly succeed Sir Herbert Warren as president of the society.

ON February 19th Dr. Stephen Smith, the doyen of American hygienists, celebrated his 94th birthday. He took his degree at the New York College of Physicians and Surgeons in 1850, and devoted himself to the study of sanitary questions. He took a leading part in establishing the Health Department of New York, of which he was the first Commissioner. He was the founder and first president of the American Public Health Association. He still takes an active part in the work of the New York State Board of Charities.

THE report of Dr. Becerra, Director-General of Sanitation of the Republic of Ecuador for 1915–16, states that during that year the mortality from tuberculosis was 1,970, being 11.7 per cent. of the general mortality. Yellow fever caused 682 deaths, dysentery 255, typhoid fever 209, diphtheria 9, typhus 4; there was no death from small-pox. Ankylostomiasis robs agriculture of hundreds of labourers, and syphilis constitutes a difficult social problem. But one of the principal causes of the stagnation of Ecuador is said to be the failure of immigration, due partly to the lack of guarantees to immigrants.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

INCOME TAX AND THE WAR LOAN.

THRIFT asks for information as to the liability to income tax of interest paid on War Loan secured by a policy taken out under a special scheme with a company.

*** It is difficult to answer this question fully without precise details of the scheme, but if we may assume that the War Loan stands in his wife's name, then the interest paid thereon is *prima facie* liable to tax to be assessed on him. In effect, the interest would be paid to her benefit in that it would, *pro tanto*, reduce her accruing indebtedness to the insurance societies. If annual interest be paid to the latter, then income tax may be deducted therefrom on payment. As regards the quarterly premiums, the usual income tax allowance is due provided that the policy is "for securing a certain sum on death." There are of course other conditions, but these are no doubt complied with in this case. We may perhaps add that in connexion with another case of War Loan interest, we understand that the view of the income tax authorities is that, as the basis of assessment is the amount of untaxed interest received in the year preceding the assessment year, the first liability arises in the year 1918–19, and is determined by the amount received in the year 1917–18.

LETTERS, NOTES, ETC.

GENERAL DE GALLIFET'S "SILVER BELLY."

THE late Marquis de Gallifet, one of the finest cavalry leaders France has ever had, and a highly capable Minister of War, had a great part of his abdominal wall torn away by a shell in Mexico. The wound never completely cicatrized, and for the rest of his life he had to wear a protective cuirass. The general was, like many good soldiers, something of a dandy, and there used to be a good deal of curiosity about what irreverent persons called his silver belly. Now we learn from the *Chronique Médicale* that Ernest Guibal, formerly *prévot d'armes* in the French army, who recently died at Berne, used to tell his pupils that he had seen the cuirass a hundred times. The general, when he came for fencing practice, always took it off. Guibal described it as a kind of coat of mail made of very thin silver plates. It was oval, measured nearly 20 cm. in width by 30 cm. in length, and was fixed round the loins by a leather strap. The wound was covered only by a very thin integument, and for this reason the marquis was advised by his doctors to protect the part by an artificial covering. In this connexion we may recall the case of Jean de Mirabeau who was left for dead at the battle of Casano with twenty-seven wounds, one of them made by a bullet which "severed the tendons" in the throat and divided the jugular vein. He lived however to beget the dour old "Ami des Hommes" who in time begat Gabriel Honoré, the Mirabeau of the Revolution. Jean had to support his injured neck with a silver stock and hence was nicknamed *col d'argent*.

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